A Plan for the Future

10-Year Strategy for the Air Traffic Control Workforce

2014 – 2023

2014
2015
2016
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2018
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2020
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2022
2023

This 2014 report is the FAA's ninth annual update to the controller workforce plan. The FAA issued the first comprehensive controller workforce plan in December 2004. It provides staffing ranges for all of the FAA's air traffic control facilities and actual onboard controllers as of September 21, 2013.

Section (221) of Public Law (108-176) (updated by Public Law 111-117) requires the FAA Administrator to transmit a report to the Senate Committee on Commerce, Science and Transportation and the House of Representatives Committee on Transportation and Infrastructure that describes the overall air traffic controller workforce plan. It is due by March 31 of each fiscal year, otherwise the FAA's appropriation is reduced by $100,000 for each day it is late.

THIS PLAN ADDRESSES THE EFFECTS OF SEQUESTRATION. THE FAA HAS ADJUSTED ITS ACTUAL STAFFING AND HIRING FORECASTS TO REFLECT THESE IMPACTS. THE FAA WILL FALL BEHIND IN STAFFING WHEN COMPARED TO PREVIOUS VERSIONS OF THIS PLAN.

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Executive Summary

Safety is the top priority of the Federal Aviation Administration (FAA) as it manages America's National Airspace System (NAS). Thanks to the expertise of people and the support of technology, tens of thousands of aircraft are guided safely and expeditiously every day through the NAS to their destinations.

Workload

An important part of managing the NAS involves actively aligning controller resources with demand. The FAA "staffs to traffic," matching the number of air traffic controllers at its facilities with traffic volume and workload. The FAA's staffing needs are dynamic due to the dynamic nature of the workload and traffic volume.

Traffic

Air traffic demand has declined significantly since 2000, the peak year for traffic. For the purposes of this plan, air traffic includes aircraft that are controlled, separated and managed by air traffic controllers. This includes commercial passenger and cargo aircraft as well as general aviation and military aircraft. In the past decade, volume has declined by 25 percent and is not expected to return to 2000 levels in the near term.

Headcount

In many facilities, the current Actual on Board (AOB) number may exceed the facility's target staffing ranges. This is because many facilities' current AOB (all controllers at the facility) numbers include many developmental controllers in training to offset expected future attrition. Individual facilities can be above the range due to advance hiring. The FAA hires and staffs facilities so that trainees are fully prepared to take over responsibilities when senior controllers leave.

Retirements

Fiscal year 2013 retirements were below projections, and slightly higher than FY 2012 actuals, while 2014 retirements are tracking slightly above projections. In the last five years, 2,790 controllers have retired. The FAA carefully tracks actual retirements and projects future losses to ensure its recruitment and training keep pace.

Hiring

In the last five years, the FAA has hired more than 5,000 new air traffic controllers. We plan to hire more than 6,600 new controllers over the next five years to keep pace with expected attrition and traffic growth. Because of the effects of sequestration, the FAA only hired 554 controllers compared to the previously reported plan of 1,315.

Training

As the FAA continues to bring these new employees on board, the training of these new employees continues to be closely monitored at all facilities. We must carefully manage the process to ensure that our trainees are hired in the places we need them and progress in a timely manner to become certified professional controllers (CPC). The FAA will also continue to take action at the facility level should adjustments become necessary due to changes in traffic volume, retirements or other attrition.

The FAA continues its efforts from an Independent Review Panel that focused on air traffic controller selection, assignment and training. The panel, part of a nationwide Call to Action on air traffic control safety and professionalism, delivered its comprehensive set of recommendations to the agency for review and implementation. About a third of the panel's 49 recommendations dealt with the selection and placement of air traffic control specialists, while the rest covered improvements to professionalism, on-the-job training instruction, learning technologies and record-keeping, and curriculum design. While budget cuts impacted implementation of some of the planned improvements, multiple workgroups continue to work on projects that adopt the panel's recommendations.

Ongoing hiring and training initiatives, as well as increased simulator use, are helping the FAA meet its goals. While the FAA is managing today's air traffic, we must also integrate new technologies into air traffic operations. From state-of-the-art simulators to satellite technology, air traffic is evolving into a more automated system. The FAA is working diligently to ensure well-trained controllers continue to uphold the highest safety standards as we plan for the future.

The FAA's goal is to ensure that the agency has the flexibility to match the number of controllers at each facility with traffic volume and workload. Staffing to traffic is just one of the ways we manage America's National Airspace System.

1 - Introduction

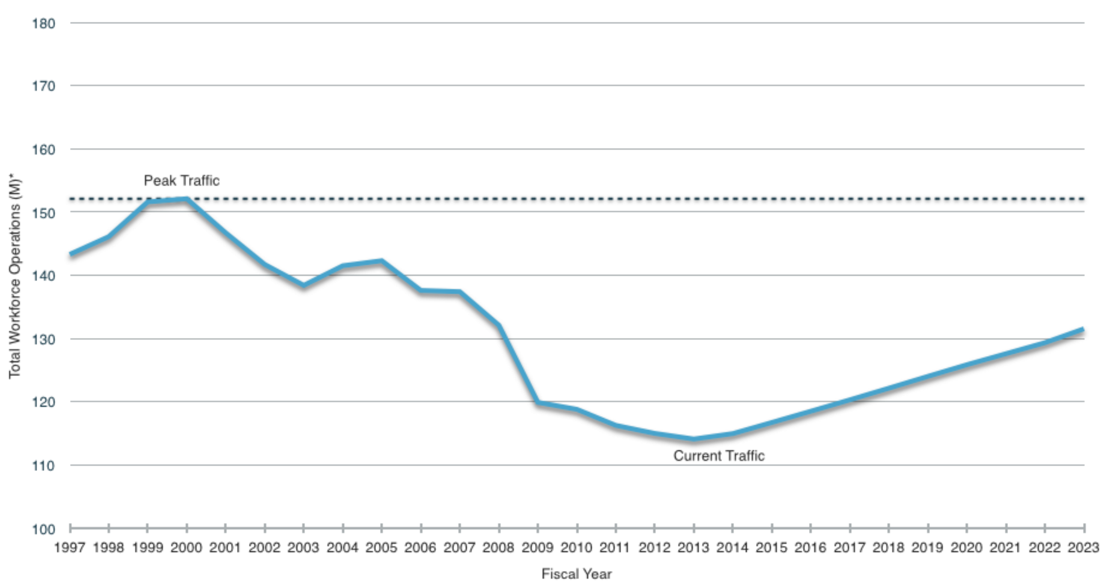
Staffing to Traffic

Air traffic controller workload and traffic volume are dynamic, and so are the FAA's staffing needs. A primary factor affecting controller workload is the demand created by air traffic, encompassing both commercial and non-commercial activity. Commercial activity includes air carrier and commuter/air taxi traffic. Non-commercial activity includes general aviation and military traffic.

Adequate numbers of controllers must be available to cover the peaks in traffic caused by weather and daily, weekly or seasonal variations, so we continue to “staff to traffic.” This practice gives us the flexibility throughout each day to match the number of controllers at each facility with traffic volume and workload.

System-wide, air traffic has declined by 25 percent since 2000. The chart in Figure 1.1 shows that air traffic volume is not expected to return to peak levels in the near term.

Figure 1.1: Traffic Forecast

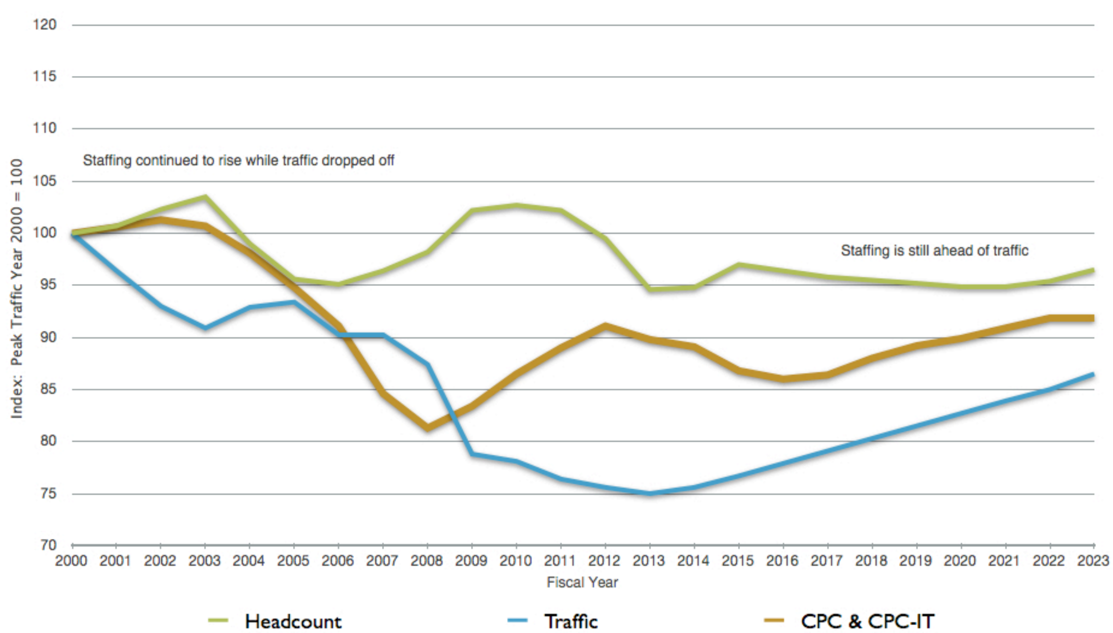


*Total Workforce Operations = Tower + TRACON + Aircraft Handled by En Route Centers

Figure 1.2 shows system-wide controller staffing and traffic, indexed from 2000 and projected through 2023. Indexing is a widely used technique which compares the change over time of two or more data series (in this case, total controller headcount, certified profession controllers (CPC) and certified professional controllers in training (CPC-IT) and traffic). The data series are set equal to each other (or indexed) at a particular point in time (in this case, the year 2000, a recent high mark for traffic) and measured relative to that index point in each successive year. This way we know how much growth or decline has occurred compared to the base value.

Staffing to traffic not only applies on a daily basis, but also means that we staff to satisfy expected needs two to three years in advance. We do this to ensure sufficient training time for new hires. Despite the decline in air traffic shown in the figure below, "staffing to traffic" requires us to anticipate controller attrition, so that we plan and hire new controllers in advance of need. The "bubble" caused by this advance-hire trainee wave is one reason that staffing remains well ahead of traffic. The gap between the green line (Headcount) and the orange line (CPC and CPC-IT staffing) is the advance hire trainee bubble and is projected to close significantly by 2023.

Figure 1.2: System-wide Traffic and Total Controller Trends



Meeting the Challenge

The FAA has demonstrated over the past several years it can handle the long-predicted wave of expected controller retirements. In the last five years, the FAA has hired 5,032 controllers. There were 2,790 retirements for the same period.

The FAA hires in advance to reflect all attrition, not just retirements. The FAA's current hiring plan has been designed to phase in new hires as needed over time. This will avoid creating another major spike in retirement eligibility in future years like the one resulting from the 1981 controller strike. We are now entering a steady-state period in which we expect new hires to mirror losses for the next several years.

Hiring, however, is just one part of the challenge. Other challenges involve controller placement, controller training and controller scheduling. It is important that newly hired and transferring controllers are properly placed in the facilities where we will need them. Once they are placed, they need to be effectively and efficiently trained, and assigned to efficient work schedules.

To address these challenges, the FAA:

• Convened an Independent Review Panel that focused on air traffic controller selection, assignment and training.

• Revised its hiring process and opened an "all sources" vacancy announcement this fiscal year

• Procured a commercially available off-the-shelf scheduling product that provides a common toolset for FAA facilities to effectively develop and maintain optimal schedules based on traffic, staffing, work rules and qualifications.

Effective and efficient training, properly placing new and transferring controllers, and efficient scheduling of controllers are all important factors in the agency's success.

Systematically replacing air traffic controllers where we need them, as well as ensuring the knowledge transfer required to maintain a safe NAS, is the focus of this plan.

2 - Facilities and Services

America's NAS is a network of people, procedures and equipment. Pilots, controllers, technicians, engineers, inspectors and supervisors work together to make sure millions of passengers move through the airspace safely every day.

More than 14,000 federal air traffic controllers in airport traffic control towers, Terminal radar approach control facilities and air route traffic control centers guide pilots through the system. An additional 1,371 civilian contract controllers and more than 10,000 military controllers also provide air traffic services for the NAS.

These controllers provide air navigation services to aircraft in domestic airspace, including 24.6 million square miles of international oceanic airspace delegated to the United States by the International Civil Aviation Organization.

Terminal and En Route Air Traffic Services

Controller teams in airport towers and radar approach control facilities watch over all planes traveling through the Terminal airspace. Their main responsibility is to organize the flow of aircraft into and out of an airport. Relying on visual observation and radar, they closely monitor each plane to ensure a safe distance between all aircraft and to guide pilots during takeoff and landing. In addition, controllers keep pilots informed about changes in weather conditions.

Once airborne, the plane quickly departs the Terminal airspace surrounding the airport.
At this point, controllers in the radar approach control notify En Route controllers who take charge in the vast airspace between airports. There are 21 air route traffic control centers around the country. Each En Route center is assigned a block of airspace containing many defined routes. Airplanes fly along these designated routes to reach their destination.

En Route controllers use surveillance methods to maintain a safe distance between aircraft. En Route controllers also provide weather advisory and traffic information to aircraft under their control. As an aircraft nears its destination, En Route controllers transition it to the Terminal environment, where Terminal controllers guide it to a safe landing.

FAA Air Traffic Control Facilities

As of October 1, 2013, the FAA operated 315 air traffic control facilities and the Air Traffic Control System Command Center in the United States. Table 2.1 lists the type and number of these FAA facilities. More than one type of facility may be collocated in the same building.

Each type of FAA facility has several classification levels based on numerous factors, including traffic volume, complexity and sustainability of traffic. To account for changes in traffic and the effect of investments that reduce complexity, as well as to compensate controllers that work the highest and most complex volume of traffic, facilities are monitored for downward and upward trends.

Table 2.1 Types and Number of FAA Air Traffic Control Facilities

Type	Name	Number of Facilities	Description
1	Tower without Radar	1	An airport traffic control terminal that provides service using direct observation primarily to aircraft operating under visual flight rules (VFR). This terminal is located at airports where the principal user category is low-performance aircraft.
2	Terminal Radar Approach Control (TRACON)	24	An air traffic control terminal that provides radar-control service to aircraft arriving or departing the primary airport and adjacent airports, and to aircraft transiting the terminal's airspace.
3	Combination Radar Approach Control and Tower with Radar	130	An air traffic control terminal that provides radar-control service to aircraft arriving or departing the primary airport and adjacent airports, and to aircraft transiting the terminal's airspace. This terminal is divided into two functional areas: radar approach control positions and tower positions. These two areas are located within the same facility, or in close proximity to one another, and controllers rotate between both areas.
4	Combination Non-Radar Approach Control and Tower without Radar	2	An air traffic control terminal that provides air traffic control services for the airport at which the tower is located and without the use of radar, approach and departure control services to aircraft operating under Instrument Flight Rules (IFR) to and from one or more adjacent airports.
6	Combined Control Facility	4	An air traffic control facility that provides approach control services for one or more airports as well as en route air traffic control (center control) for a large area of airspace. Some may provide tower services along with approach control and en route services.
7	Tower with Radar	130	An airport traffic control terminal that provides traffic advisories, spacing, sequencing and separation services to VFR and IFR aircraft operating in the vicinity of the airport, using a combination of radar and direct observations.
8	Air Route Traffic Control Center (ARTCC)	21	An air traffic control facility that provides air traffic control service to aircraft operating on IFR flight plans within controlled airspace and principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance services may be provided to VFR aircraft.
9	Combined TRACON Facility	3	An air traffic control terminal that provides radar approach control services for two or more large hub airports, as well as other satellite airports, where no single airport accounts for more than 60 percent of the total Combined TRACON facility's air traffic count. This terminal requires such a large number of radar control positions that it precludes the rotation of controllers through all positions.
—	Air Traffic Control System Command Center	1	The Air Traffic Control System Command Center is responsible for the strategic aspects of the NAS. The Command Center modifies traffic flow and rates when congestion, weather, equipment outages, runway closures or other operational conditions affect the NAS.

Total	316

3 - Staffing Requirements

The FAA issued the first comprehensive controller workforce plan in December 2004. “A Plan for the Future: 10-Year Strategy for the Air Traffic Control Workforce” detailed the resources needed to keep the controller workforce sufficiently staffed. This report is updated each year to reflect changes in traffic forecasts, retirements and other factors.

“Staffing to traffic” requires the FAA to consider many facility-specific factors. They include traffic volumes based on FAA forecasts and hours of operation, as well as individualized forecasts of controller retirements and other non-retirement losses. In addition, staffing at each location can be affected by unique facility requirements such as temporary airport runway construction, seasonal activity and the number of controllers currently in training. Staffing numbers will vary as the requirements of the location dictate.

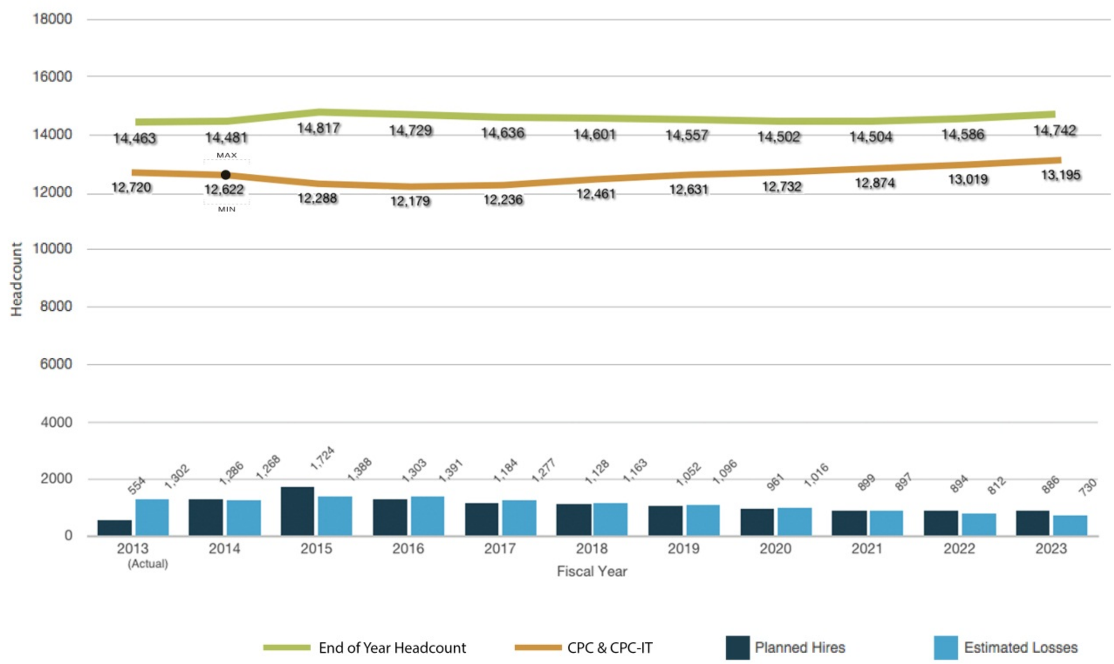
Proper staffing levels also depend on the efficient scheduling of employees, so the FAA tracks a number of indicators as part of its continuous staffing review. Some of these indicators are overtime, time on position, leave usage and the number of trainees. For example, in FY 2013, the system average for overtime was 1.7 percent, a slight decrease from the FY 2012 level. Meanwhile, average time on position was 4 hours and 8 minutes for both FY 2012 and FY 2013.

Figure 3.1 shows the expected end-of-year total headcount (green line), CPC & CPC-IT headcount (orange line), losses and new hires by year through FY 2023.

Figures for FY 2013 represent actual end-of-year headcount, losses and hires. Losses include retirements, promotions and transfers, resignations, removals, deaths, developmental attrition and academy attrition. Due to the impacts of sequestration, the FAA ended FY 2013 nearly 600 controllers below the FY 2013 plan.

In general, the FAA strives to keep the number of CPCs and CPC-ITs near the middle of the calculated staffing range. Figure 3.1 shows that FY 2014 staffing values are within the calculated staffing range shown by the “min” and “max” bars. A facility’s total staffing levels are often above the defined staffing range because new controllers are typically hired two to three years in advance of expected attrition to allow for sufficient training time. The total expected end-of-year staffing number shown in Figure 3.1 reflects this projected advanced hiring.

Figure 3.1: Projected Controller Workforce Controller Trends



Staffing Ranges

Each of the FAA's 315 facilities typically staffs open positions with a combination of certified controllers who are proficient, or checked out, in specific sectors or positions. Because traffic and other factors are dynamic at these facilities, the FAA produces facility-level controller staffing ranges. These ranges are calculated to ensure that there are enough controllers to cover operating positions every day of the year.

Ensuring that we have enough controllers is not only important on a daily basis, but also means that we staff to satisfy expected needs two to three years in advance. We do this to ensure sufficient training time for new hires. The "bubble" caused by hiring two to three years ahead of time is one reason that staffing remains well ahead of traffic.

The FAA uses four data sources to calculate staffing ranges. Three are data driven, the other is based on field judgment. They are:

1. Staffing standards – mathematical models used to relate controller workload and air traffic activity.

2. Service unit input – the number of controllers required to staff the facility, typically based on past position utilization and other unique facility operational requirements. The service unit input is validated by field management.

3. Past productivity – the headcount required to match the historical best productivity for the facility. Productivity is defined as operations per controller. Facility productivity is calculated using operations and controller data from the years 2000 to 2013. If any annual point falls outside +/- 5 percent of the 2000 to 2013 average, it is thrown out. From the remaining data points, the highest productivity year is then used.

4. Peer productivity – the headcount required to match peer group productivity. Like facilities are grouped by type and level and their corresponding productivity is calculated. If the facility being considered is consistently above or below the peer group, the peer group figure is not used in the overall average and analysis.

The average of this data is calculated, rounded to the nearest whole number, multiplied by +/- 10 percent and then rounded again to determine the high and low points in the staffing range.

Exceptional situations, or outliers, are removed from the averages (for example, if a change in the type or level of a facility occurred over the period of evaluation). By analyzing the remaining data points, staffing ranges are generated for each facility.

The 2014 staffing ranges for certified controllers are published by facility in the Appendix of this report. In general, the FAA strives to keep the number of CPCs and CPC-ITs near the middle of the range. In many facilities, the current Actual on Board (AOB) number may appropriately exceed the range. This is because many facilities' current AOB (all controllers at the facility) numbers include larger numbers of developmental controllers in training to offset expected future attrition. Individual facilities can be above the range due to advance hiring. Facilities may also be above the range based upon facility-specific training and attrition forecasts.

In the longer term, the number of new hires and total controllers will decline as the current wave of developmental controllers become CPCs, and the long-expected retirement wave has passed. At that point, the vast majority of the controllers will be CPCs and certified professional controllers in training (CPC-IT), and more facilities will routinely fall within the ranges.

Figure 3.2: Controller Staffing

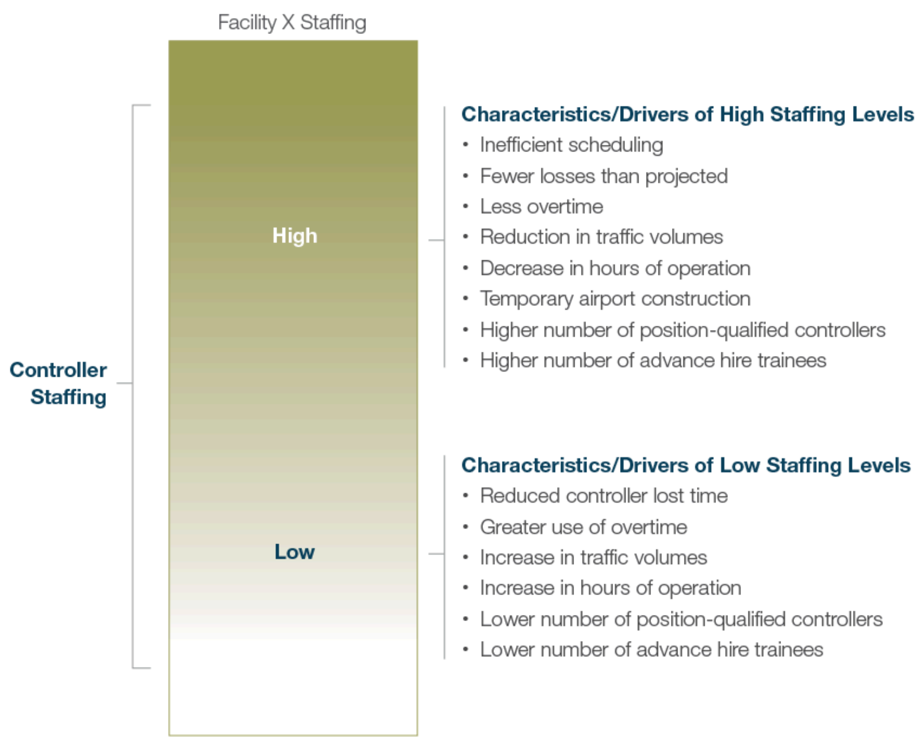


Figure 3.3 depicts an example of a large, Type 3 FAA facility. This Combination Radar Approach Control and Tower with Radar facility is one in which controllers work in the tower cab portion and in the radar room (also known as a TRACON). To be a CPC in these types of facilities, controllers must be checked out on all positions in both the tower and the TRACON.

Trainees are awarded “D1” status (and the corresponding increase in pay) after being checked out on several positions. The levels of responsibility (and pay) gradually increase as trainees progress through training.

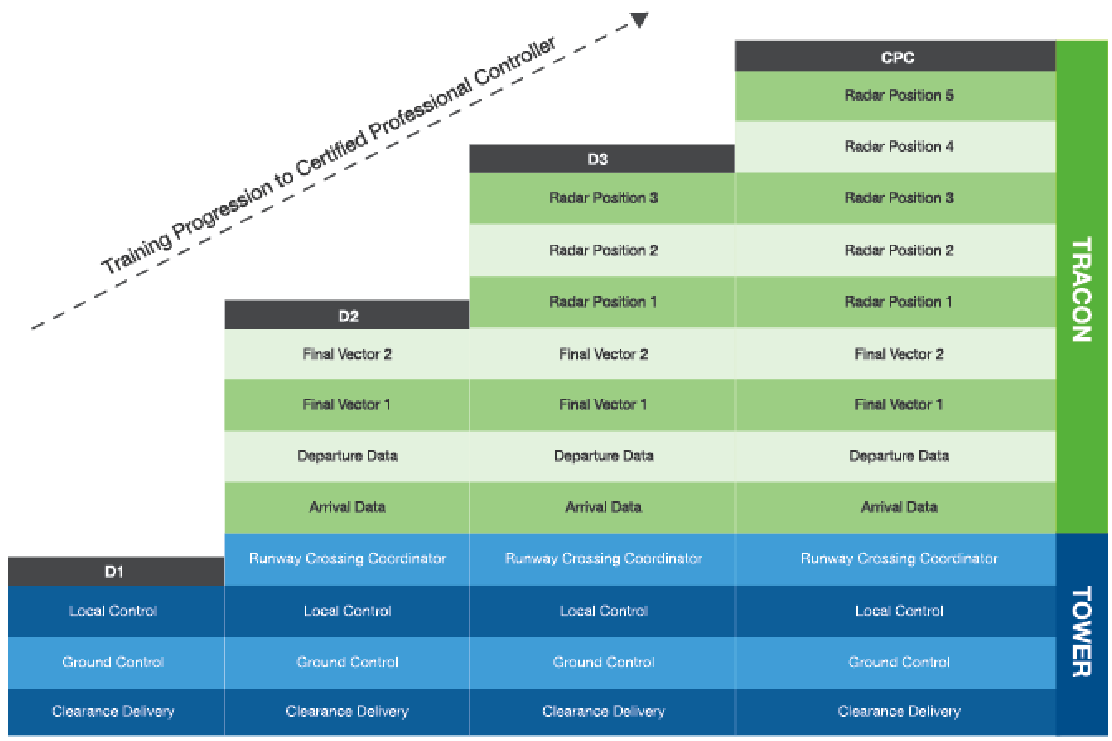
Once developmental controllers are checked out at the D1 level, they can work several positions in the tower (Clearance Delivery, Ground Control and Local Control). Once checked out on the Runway Crossing Coordinator position, the developmental controller would be considered tower certified, but still not a CPC, as CPCs in this type of facility must also be certified on positions in the radar room.

The FAA hires and staffs facilities so that trainees are fully prepared to take over responsibilities when senior controllers retire.

The levels of responsibility continue to increase as one progresses toward CPC status, but trainees can and do control traffic much earlier in the training process. Historically, the FAA has used these position-qualified controllers to staff operations and free up CPCs for more complex positions as well as to conduct training.

Having the majority of the workforce checked out as CPCs makes the job of scheduling much easier at the facility. CPCs can cover all positions in their assigned area, while position-qualified developmentals require the manager to track who is qualified to work which positions independently. This task will be easier once the FAA's operational planning and scheduling (OPAS) tool is fully implemented.

Figure 3.3 Controller Training Progression



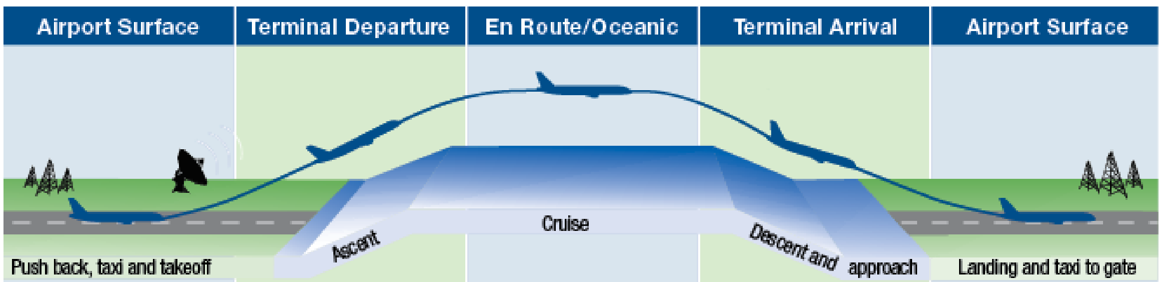
Trainees are defined as the number of developmental and certified professional controllers in training.

Air Traffic Staffing Standards Overview

The FAA has used air traffic staffing standards to help determine controller staffing levels since the 1970s.

FAA facilities are currently identified and managed as either Terminal facilities where airport traffic control services are provided, including the immediate airspace around an airport, or En Route facilities where high-altitude separation services are provided using computer systems and surveillance technologies. Terminal facilities are further designated as tower cabs or TRACONs. These Terminal facilities may be collocated in the same building, but because of differences in workload, their staffing requirements are modeled separately.

Figure 3.4 Air Traffic Control Position and Facility Overview



Airport Traffic Control Tower (ATCT)

Ground Controller
Issues approval for push back from gate and issues taxi instructions and clearances.

Local Controller
Issues takeoff clearances, maintains prescribed separation between departure aircraft, provides departure aircraft with latest weather/field conditions.

Clearance Delivery
Issues IFR and VFR flight plan clearances.

Flight Data
Receives and relays weather information and Notice to Airmen.

Terminal Radar Approach Control (TRACON)

Departure Controller
Assigns headings and altitudes to departure aircraft. Hands off aircraft to the En Route Radar Controller.

Flight Data - Radar
Issues IFR flight plan clearances to aircraft at satellite airports, coordinates releases of satellite departures.

Air Route Traffic Control Center (ARTCC)

Radar Controller
Ensures the safe separation and orderly flow of aircraft through En Route center airspace (includes oceanic airspace).

Radar Associate
Assists the Radar Controller.

Radar Associate (Flight Data)
Supports the Center Radar Controller by handling flight data.

Terminal Radar Approach Control (TRACON)

Arrival Controller
Assigns headings and altitudes to arrival aircraft to establish aircraft on final approach course.

Airport Traffic Control Tower (ATCT)

Local Controller
Issues landing clearances, maintains prescribed separation between arrivals, provides arrival aircraft with latest weather/field conditions.

Ground Controller
Issues taxi instructions and clearances to guide aircraft to the gate.

The dynamic nature of air traffic controller workload coupled with traffic volume and facility staffing needs are all taken into account during the development of FAA staffing standards and models.

All FAA staffing models incorporate similar elements:

• Controller activity data is collected and processed quarterly, commensurate with the type of work being performed in the facilities.

• Models are developed that relate controller workload to air traffic activity. These requirements are entered into a scheduling algorithm.

• The modeled workload/traffic activity relationship is forecast for the 90th percentile (or 37th busiest) day for future years for each facility. Staffing based on the demands for the 90th percentile day assures that there are adequate numbers of controllers to meet traffic demands throughout the year.

• Allowances are applied for off-position activities such as vacation, training and additional supporting activities that must be accomplished off the control floor.

The FAA incorporated recommendations found in the Transportation Research Board special report "Air Traffic Control Facilities, Improving Methods to Determine Staffing Requirements." These recommendations included significantly expanding the amount of input data and improving the techniques used to develop the standards.

All staffing models went through similar development processes. Some components of the model-development phase varied as a function of the work being performed by the controllers. For example, a crew-based approach was used to model tower staffing requirements because the number and type of positions in a tower cab vary considerably as traffic changes, compared to those of a single sector in a TRACON or En Route center. All staffing models reflect the dynamic nature of staffing and traffic. Controller staffing requirements can vary throughout the day and throughout the year.

The National Academy of Sciences is currently reviewing the FAA's staffing standards, planning and tactical staffing decision-making processes. The results of this review are expected in July 2014.

Tower Cab Overview

Air traffic controllers working in tower cabs manage traffic within a radius of a few miles of the airport. They instruct pilots during taxiing, takeoff and landing, and they grant clearance for aircraft to fly. Tower controllers ensure that aircraft maintain minimum separation distances between landing and departing aircraft, transfer control of aircraft to TRACON controllers when the aircraft leave their airspace, and receive control of aircraft for flights coming into their airspace.

• There are a variety of positions in the tower cab, such as Local Control, Ground Control, Flight Data, Coordinator, etc. Depending on the airport layout and/or size of the tower cabs (some airports have more than one tower), there can be more than one of the same types of position on duty.

• As traffic, workload and complexity increase, more or different positions are opened; as traffic, workload and complexity decrease, positions are closed or combined with other positions. In practice, minimum staffing levels may be determined by hours of operation and work rules.

Important factors that surfaced during the tower staffing model development included the availability, accessibility and increased reliability of traffic data and controller on-position reporting systems. The FAA is now able to analyze much larger quantities of tower data at a level of granularity previously unattainable. Staffing data and traffic volumes are collected for every facility.

The revised tower cab standards were developed using regression analysis as the primary method for modeling the relationship between staffing and workload drivers. The models relate observed, on-position controllers to the type and amount of traffic they actually handle. Regression analysis allows us to relate modeled controller staffing requirements with traffic activity and then use this relationship to predict future staffing requirements (standards) based on traffic projections.

TRACON Overview

Air traffic controllers working in TRACONs typically manage traffic within a 40-mile radius of the primary airport; however, this radius varies by facility. They instruct departing and arriving flights, and they grant clearance for aircraft to fly through the TRACON's airspace. TRACON controllers ensure that aircraft maintain minimum separation distances between landing and departing aircraft, transfer control of aircraft to tower or En Route center controllers when the aircraft leave their airspace, and receive control of aircraft for flights coming into their airspace.

• TRACON airspace is divided into sectors that often provide services to multiple airports. Consolidated or large TRACONs in major metropolitan areas provide service to several primary airports. Their airspace is divided into areas of specialization, each of which contains groups of sectors.

• Controllers are assigned to various positions such as Radar, Final Vector, Departure Data, etc., to work traffic within each sector. These positions may be combined or de-combined based on changes in air traffic operations.

• As traffic, workload and complexity increase, the sectors may be subdivided (de-combined) and additional positions opened, or the sector sizes can be maintained with an additional controller assigned to an assistant position within the same sector.

• Similarly, when traffic, workload and complexity decline, the additional positions can be closed or the sectors recombined. In practice, minimum staffing levels may be determined by hours of operation and work rules.

Like the tower analysis, the FAA is able to analyze much larger quantities of TRACON data at a level of granularity previously unattainable. Important factors surfaced during the TRACON staffing model review including the availability, accessibility and increased reliability of traffic data and controller on-position reporting systems. Staffing data and traffic volumes were collected for every facility.

The TRACON standards models were updated in early 2009. The revised TRACON standards were developed using regression analysis as the primary method for modeling the relationship between staffing and workload drivers. The models relate observed, on-position controllers to the type and amount of traffic they actually handled. Regression allows us to relate modeled controller staffing requirements with traffic activity and then use this relationship to predict future staffing requirements (standards) based on traffic projections.

En Route Overview

Air traffic controllers assigned to En Route centers guide airplanes flying outside of Terminal airspace. They also provide approach control services to small airports around the country where no Terminal service is provided. As aircraft fly across the country, pilots talk to controllers in successive En Route centers.

• En Route center airspace is divided into smaller, more manageable blocks of airspace called areas and sectors.

• Areas are distinct, and rarely change based on changes in traffic. Within those areas, sectors may be combined or de-combined based on changes in air traffic operations.

• Controllers are assigned to positions within the sectors (e.g., Radar, Radar Associate, Tracker). As traffic increases, sectors can be de-combined and additional positions opened, or the sector sizes can be maintained but additional controllers added to assistant positions within the sectors.

• Similarly, when traffic declines, the additional positions can be closed or the sectors recombined. In practice, minimum staffing levels may be determined by hours of operation and work rules.

The FAA's Federally Funded Research and Development Center, operated by the MITRE Corporation, developed a model to generate data needed for the FAA's staffing models. Like the tower and TRACON standards models, this approach incorporated actual traffic and more facility-specific data.

MITRE's modeling approach reflects the dynamic nature of the traffic characteristics in a sector. It estimates the number of controllers, in teams of one to three people, necessary to work the traffic for that sector in 15-minute intervals. Differences in traffic characteristics in a sector could require different numbers of controllers to handle the same volume of traffic. For example, at one time most traffic might be cruising through a sector toward another location requiring minimal controller intervention. At another time, traffic might be climbing and descending through the same sector, a more complex scenario requiring more controllers. The same modeling techniques were applied uniformly to all sectors, providing results based on a common methodology across the country.

The FAA's staffing models incorporate the input data provided by MITRE, run it through a shift scheduling algorithm, apply traffic growth forecasts, and then apply factors to cover vacation time, break time, training, etc., to provide the staffing ranges presented in this plan for each En Route center.

In September 2010 the National Academy of Sciences completed a review at the FAA's request of MITRE's workload modeling capabilities. The review "concludes that the model is superior to past models because it takes into account traffic complexity when estimating task load. It recommends obtaining more operational and experimental data on task performance, however, to establish and validate many key model assumptions, relationships and parameters."

While remaining cognizant of the currently tight fiscal environment, the FAA has continued its work with MITRE to address the National Academy of Sciences recommendations. One recommendation is that MITRE observe controllers in the field. In response to this recommendation, MITRE collaborated with the FAA and the National Air Traffic Controllers Association (NATCA) to develop a plan to evaluate the En Route workload model. The evaluation seeks to validate the model by ensuring it covers tasks that are the major drivers of workload, quantifies task performance times, and determines task scheduling distributions. The evaluation consists of two components: field observations and laboratory human-in-the-loop (HITL) experiments. The goals of the evaluation are to assess model task coverage across facilities, evaluate task performance times and distributions, estimate position to traffic thresholds, and calibrate a task time development approach for new tasks.

Operational Planning and Scheduling (OPAS)

Optimizing controller schedules is a critical aspect of efficient workforce planning, since inefficient facility schedules can lead to excess staffing and/or increased overtime. Currently, the FAA's air traffic facilities do not have access to a standardized, automated tool to assist them in developing optimal schedules and analyzing long-term workforce planning requirements. FAA facilities currently use a variety of non-standard methods that do not fully incorporate the complex resource management requirements that exist in today's environment.

To address this need, the FAA has procured a commercially available "off-the-shelf" system that has been configured to FAA-specific requirements (e.g., national labor contract terms, FAA policy). The FAA's Operational Planning and Scheduling (OPAS) tool will provide a common toolset for FAA facilities to effectively develop and maintain optimal schedules based on traffic, staffing, work rules, and employee qualifications. Similar systems are being used by air navigation service providers worldwide and are commonplace in best-practice companies.

More specifically, OPAS will be used to create and analyze optimized schedules over variable time frames, with viewing capability in days, weeks, months, years and seasons. The system is able to:

• Generate optimal schedules for a given period (day, pay period, month, and year) based on demand, business rule constraints, employee qualification requirements and available resources.

• Calculate optimal shift start times and associated demand in support of national and local bargaining.

• Distribute employees across various shifts in the most efficient way to cover demand while abiding by business and contractual rules.

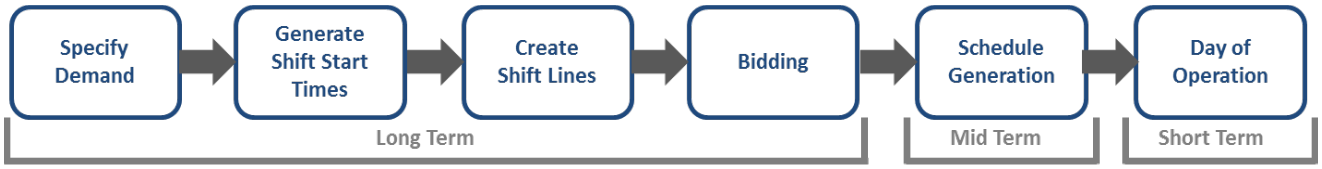
• Calculate projected time on position (signed on and controlling traffic) to staff an area by shift, schedule segment and/or person.

• Run what-if analyses.

• Aid in the assignment of efficiently scheduled overtime.

• Automate shift requests, bid process and other scheduling-related tasks.

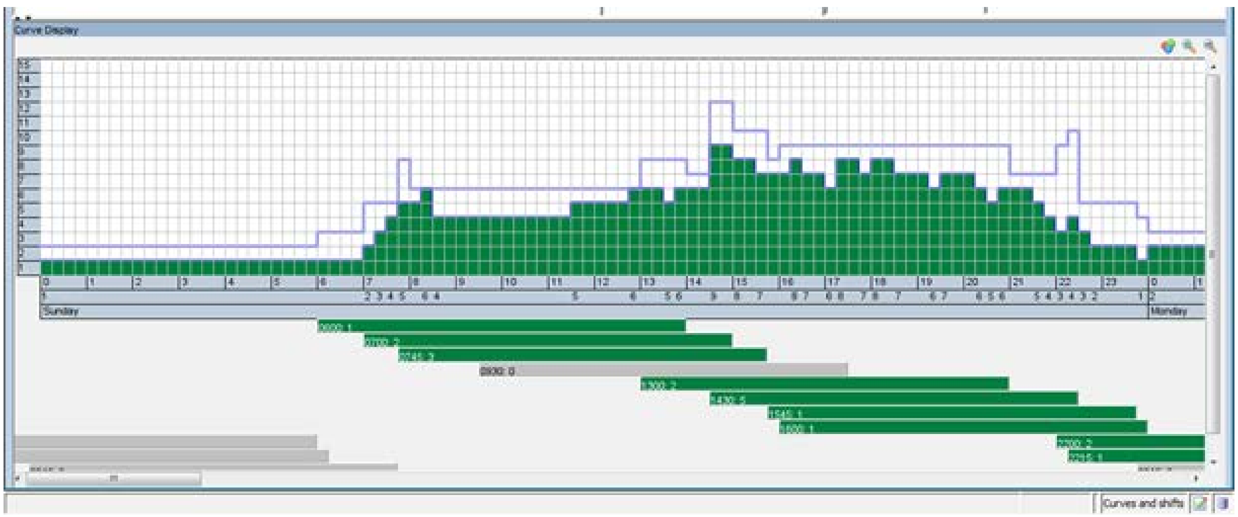
The major functionalities in the OPAS application are split into long-term (typically annually), mid-term (generating schedules), and short-term (day of operations). A typical workflow is shown below:



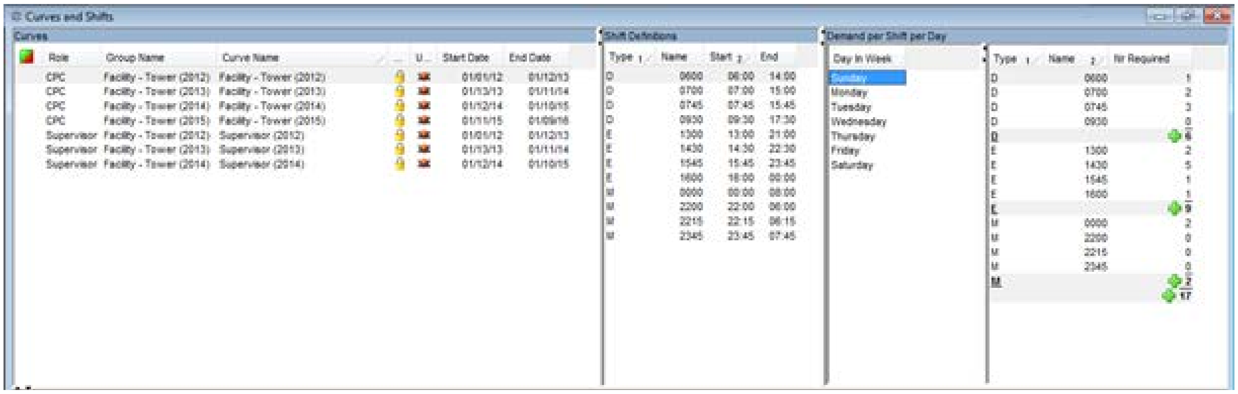
Specify Demand

OPAS determines the minimum number of controllers required to manage traffic based on an inputted demand curve. The demand curve gives the raw staffing required per 15-minute interval in a series of one-week periods. The number of different curves used can vary from one to 52 one-week curves. For example, one demand curve may describe the period from January to February- and another the period from February to May, etc. If the summer is a particularly busy time, two separate demand curves can be used (one for the summer and one for the winter). The number of demand curves used in the field is determined after a statistical analysis and consultation with the facility.

OPAS uses a mathematical algorithm to minimize the number of controllers needed to satisfy these demand periods. The first optimizer defines the shift start times (all eight-hour shifts) and the demand associated with each shift on a daily basis. This minimum demand number helps the facility determine whether it is possible to approve leave, or whether someone needs to be moved from an evening shift to a day shift to adequately cover the traffic demand



The above diagram shows how OPAS uses the 15-minute demand (green blocks) to create the required shifts in the lower part of the diagram. OPAS allows for a different demand curve for different roles (e.g. controller versus supervisor), thus allowing for optimal schedules to be made for all positions in a facility. The blue line above the green blocks shows how the staffing per shift generated by OPAS more than adequately covers the inputted green demand curve.



In the above diagram, the left pane gives the category, names, and start and end times for the optimal shifts. There are three core shifts (one for the day shift, evening shift, and midnight shift) and three ancillary shifts per shift category. The last two panes give the demand per shift per day. In this example, since “Sunday” is selected, the last pane gives the minimum demand per shift on Sunday.

Manage a Schedule/Day of Operation Views

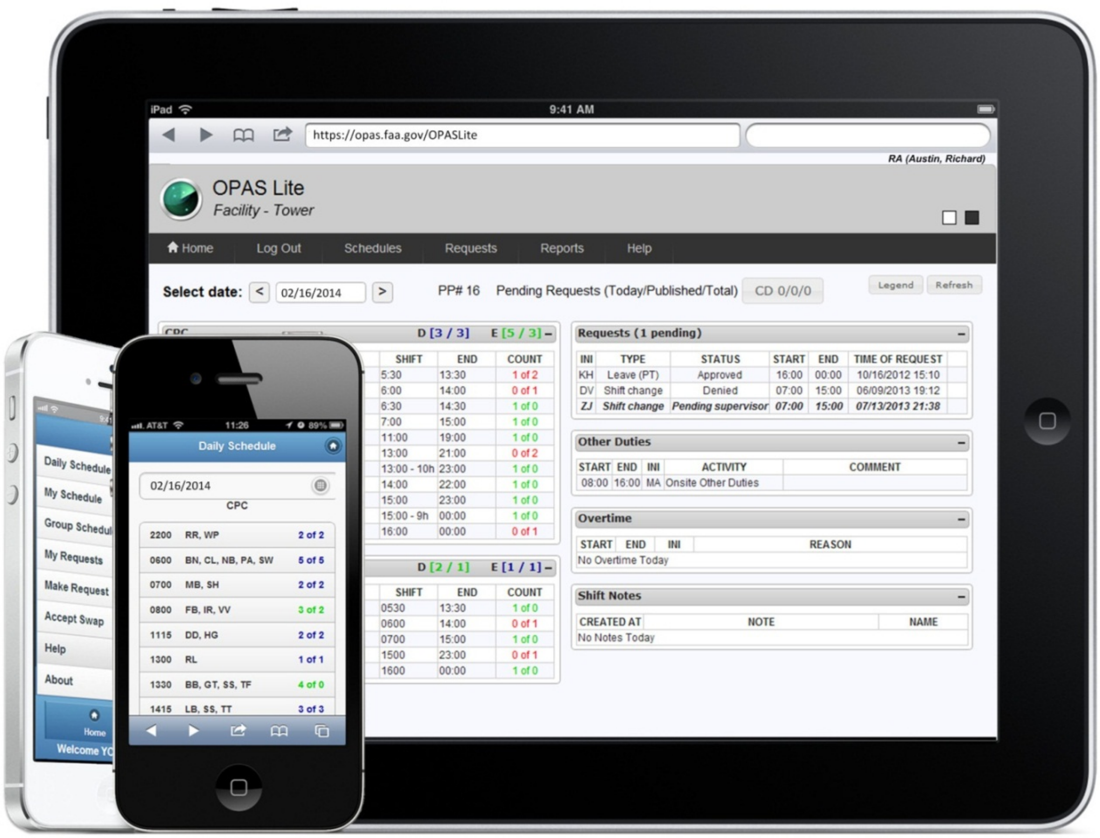
Other views drill down to show the details of a single day. They allow the user to get a quick overview of what is happening on a given day, including leave, overtime, briefing periods and other duties (like ERAM training or special assignments). These views are updated in real time for all viewers as employees enter requests, and changes are made to the schedule.

The views can also address questions such as:

- "Who is scheduled to work today and when?"
- "Who is scheduled to work overtime?"
- "Who has a leave request for today, pending or approved?"

OPAS Lite

OPAS Lite is a mobile Web application developed to provide access to many of the major functions within OPAS. It is accessible on modern browsers and devices such as smartphones and tablets. OPAS Lite allows users to view and interact with their schedule anywhere, anytime. Functionality in OPAS Lite also includes a desktop kiosk (view-only mode), quick changing of users, viewing schedules, submitting requests and proxy requests, and viewing and acting on requests.



Technological Advances

The Next Generation Air Transportation System (NextGen) is taking shape. Recent efforts to expand the use of Performance Based Navigation are already paying off in fuel savings and increased capacity in key parts of the National Airspace System (NAS). Infrastructure that was committed to in recent years, including Automatic Dependent Surveillance-Broadcast (ADS-B) and the modernization of major automation systems, is being deployed and creating the tangible foundation for NextGen. Meanwhile the FAA continues to mature the next wave of NextGen capabilities, including Data Communications (Data Comm), En Route Automation Modernization (ERAM), the next generation of voice switches and new concepts for weather management.

These investments are expected to drive substantial benefits for the FAA and its stakeholders over time. For air carriers, NextGen aims to create a more predictable, efficient environment that saves customers time and allows for better decision-making about resources, including crew scheduling and fuel usage. For the FAA, NextGen should lead to a range of benefits, including increased productivity from a workforce using a full suite of modern tools.

While there are many NextGen technologies on the horizon, Data Comm and ERAM are believed to have to most impact on air traffic controller productivity in the near term. Data Comm is a key transformational program in the NextGen portfolio that provides a digital data mode of communication between air traffic controllers and pilots. It will enable controllers to send routine instructions, such as revised departure clearances and weather-avoiding reroutes, directly to the flight deck with the push of a button. ERAM technology is the heart of NextGen and the pulse of the NAS. It is helping to advance our transition from a ground-based system of air traffic control to a satellite-based system of air traffic management. ERAM technology processes flight radar data, provides communications and generates display data for air traffic controllers. More than 80 percent of all En Route air traffic controllers have received ERAM training.

In late 2015, we expect Data Comm to begin its initial phase deploying revised departure clearance services (DCL) to 57 of 73 Tower Data Link Services (TDLS) airports. The second phase, once approved, would provide initial En Route services, including transfer of communications (TOC) and initial check-in (IC) capabilities, with deployment to centers beginning in 2019. Data Comm will reduce the talk time between controllers and pilots including correcting read-back errors, enabling controllers to handle more traffic. Future ERAM enhancements could also improve controller productivity, but the scope and precise impact of those enhancements are still under development.

Increased productivity and efficiency, and their ultimate impact on the size and composition of the FAA’s workforce, depend on many factors. Similar to the statement above concerning ERAM, the scope and precise impact of NextGen enhancements are still under development.

Over time the relationship between pilots and air traffic controllers will evolve. The relationship between controller and automated systems will similarly evolve. These evolutions will occur gradually and require much testing and analysis to ensure the safety of the system. The FAA's top priority is ensuring safe skies and airfields, and NextGen innovation and improvements are delivering just that.

More than 80 percent of all En Route air traffic controllers have received ERAM training. ERAM is foundational for NextGen.

4 - Losses

In total, the FAA expects to lose almost 1,400 controllers due to retirements, promotions and other losses this fiscal year. Other controller losses include transfers, resignations, removals, deaths, developmental attrition and academy attrition.

The FAA hires and staff facilities so that trainees are fully prepared to take over responsibilities when senior controllers leave.

Controller Loss Summary

Table 4.1 shows the total estimated number of controllers that will be lost, by category, over the period FY 2014 through FY 2023.

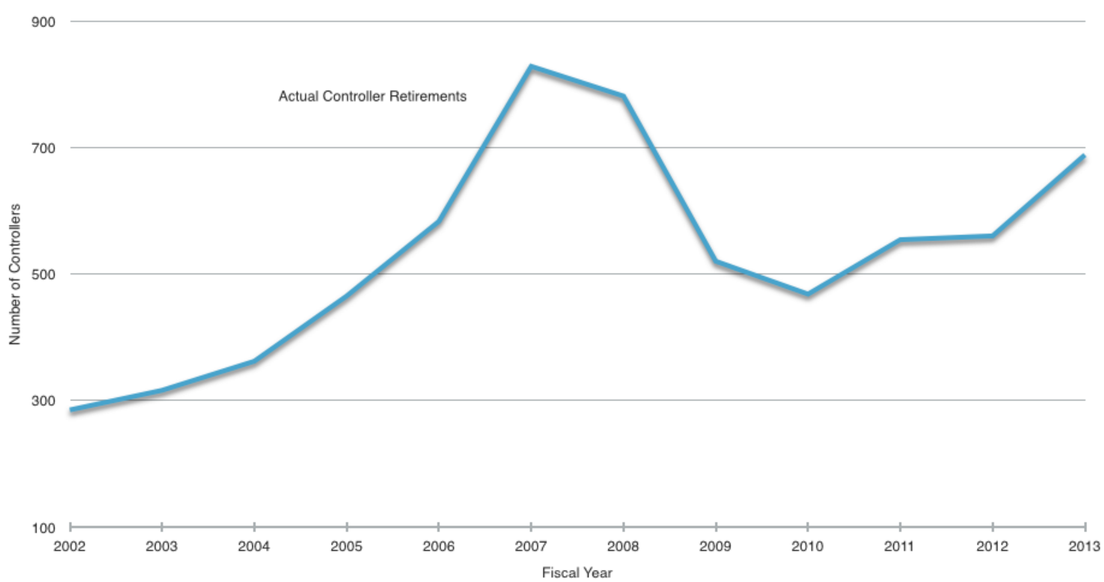
Table 4.1 Controller Loss Summary

Loss Category	Losses: 2014 - 2023
Retirements	4,935
Resignations, Removals and Deaths	484
Developmental Attrition	987
Promotions/Transfers	3,012
Academy Attrition	1,620
Total	**11,038**

Actual Controller Retirements

Fiscal year 2007 was correctly projected to be a peak year for retirements of controllers hired in the early 1980s.

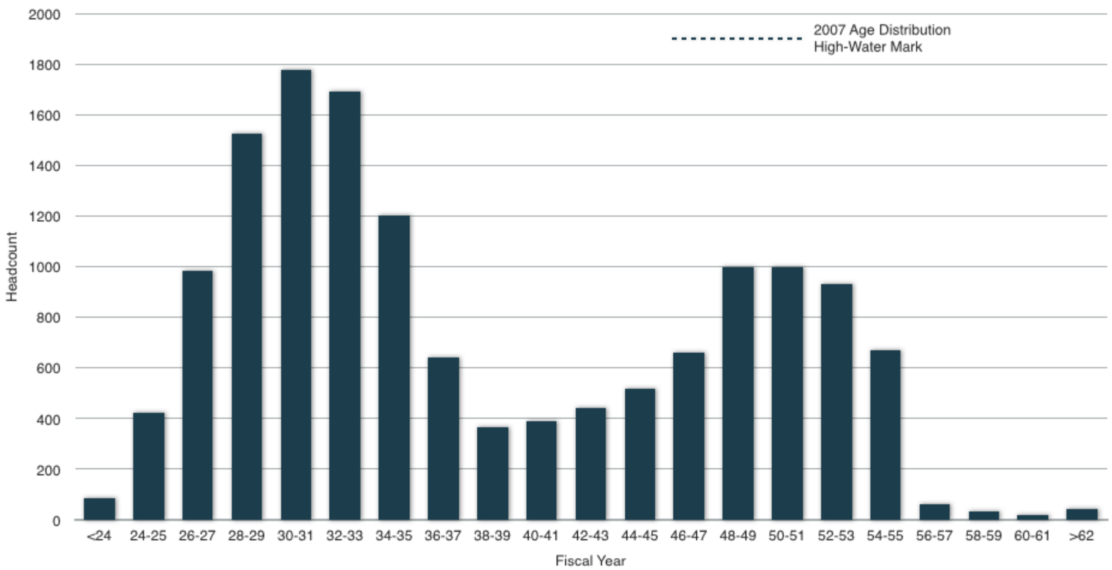
Figure 4.1: Actual Controller Retirements



Controller Workforce Age Distribution

The agency hired a substantial number of controllers in the years immediately following the 1981 strike. This concentrated hiring wave meant a large portion of the controller workforce would reach retirement age in roughly the same time period. In September 2005, the age distribution peak on the right side of Figure 4.2 was greater than 1,900 controllers. Today, the magnitude of that remaining peak is down to about 1,000 controllers.

Figure 4.2: Controller Workforce Age Distribution as of September 21, 2013



Today's hiring plans are designed to gradually phase in new hires as needed. This will also spread out the retirement eligibility of the current wave of new hires and reduce the magnitude of the retirement eligibility peak in future years.

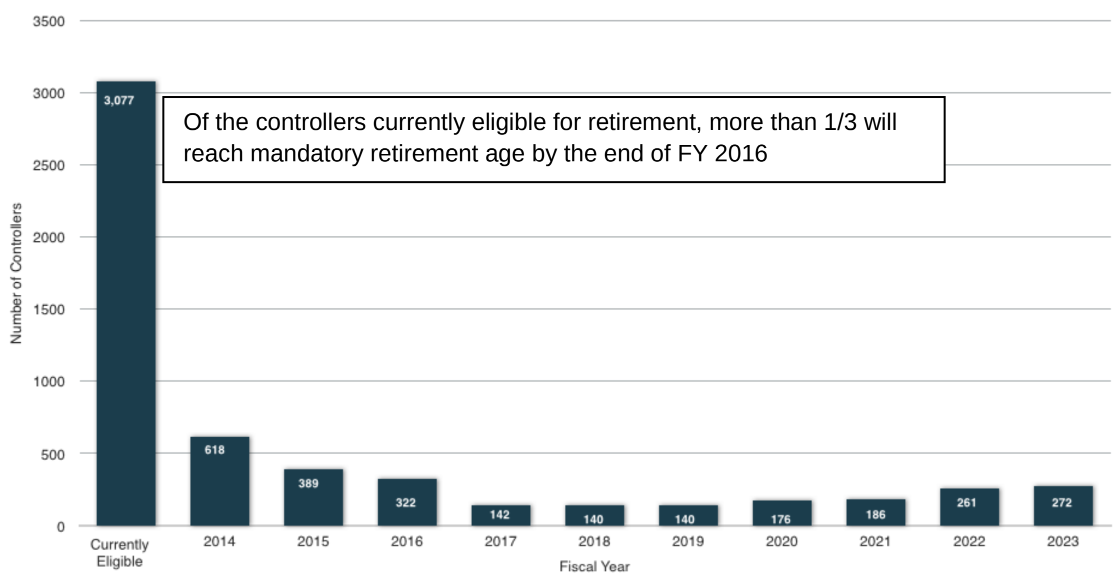
Controller Retirement Eligibility

In addition to normal civil service retirement criteria, controllers can become eligible under special retirement criteria for air traffic controllers (age 50 with 20 years of “good time” service or any age with 25 years “good time” service). “Good time” is defined as service in a covered position, as defined in Public Law 92-297. Under Public Law 92-297, air traffic controllers are usually required to retire at age 56.

After computing eligibility dates using all criteria, the FAA assigns the earliest of the dates as the eligibility date. Eligibility dates are then aggregated into classes based on the fiscal year in which eligibility occurs.

Figure 4.3 shows the number of controllers who are currently retirement eligible as of September 2013 and those projected to become retirement eligible each fiscal year through FY 2023. Agency projections show that an additional 618 controllers will become eligible to retire in FY 2014.

Figure 4.3: Retirement Eligibility



Controller Retirement Pattern

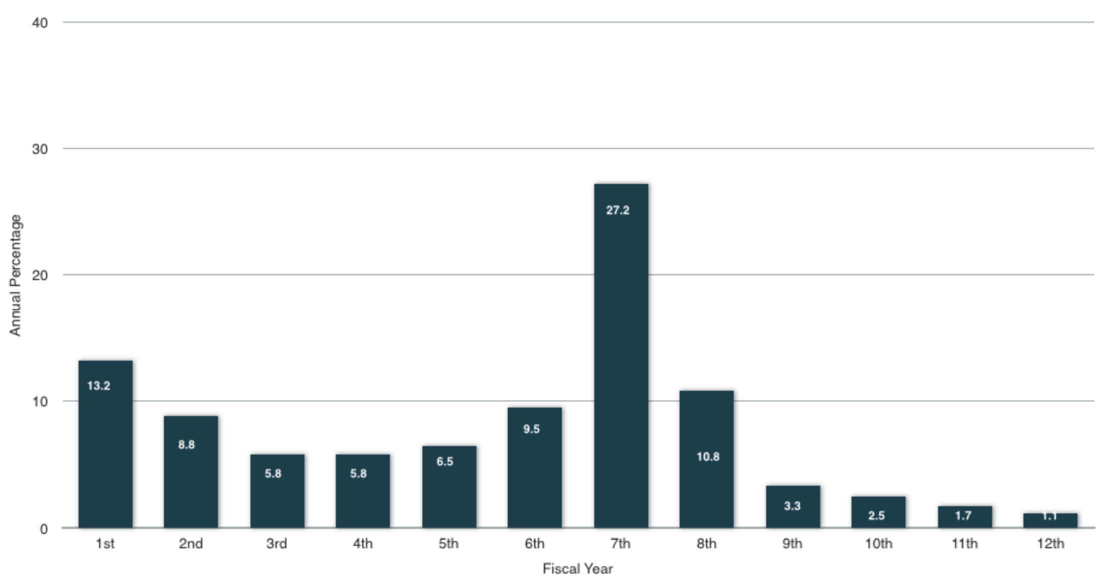
History shows that not all controllers retire when they first become eligible. In 2013, 13.2 percent of controllers who first became eligible actually retired. This is up from 12.4 percent in the previous year's plan.

Since the economic downturn began in 2008, the FAA has observed that many controllers are delaying retirement until they get closer to the mandatory retirement age of 56. Because most controllers first become retirement eligible at age 50, they typically reach mandatory retirement age in their seventh year of eligibility.

These trends are seen in Figure 4.4 below, which shows fewer controllers are retiring earlier in their eligibility and are waiting until closer to their mandatory retirement age.

Despite the increased likelihood of delayed retirement, the majority of controllers still leave the controller workforce prior to reaching the mandatory age.

Figure 4.4: Percent of Controllers Retiring in the Nth Fiscal Year of Their Eligibility



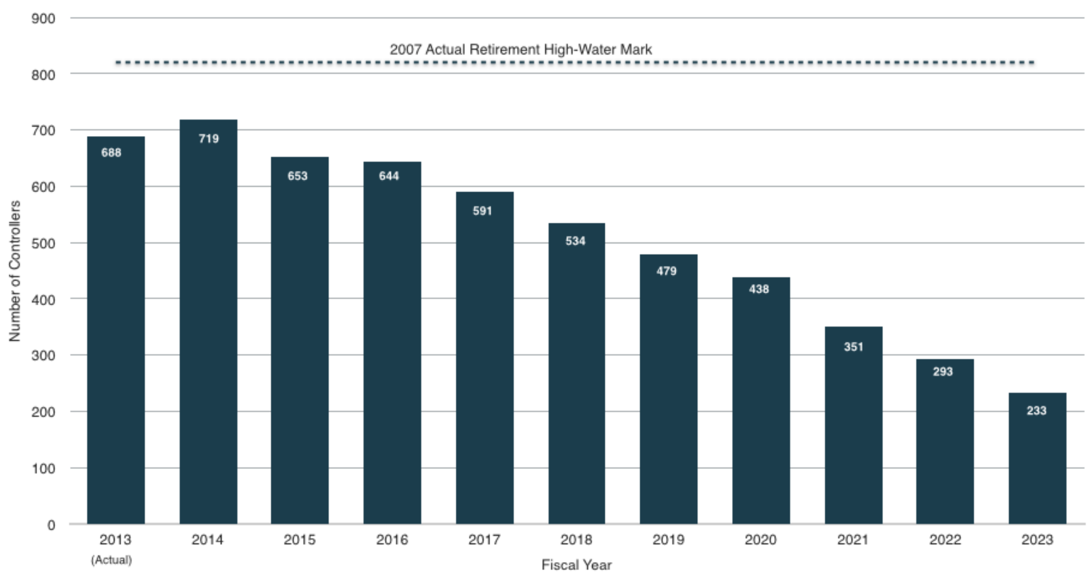
Controller Losses Due to Retirements

For the current plan, the agency incorporated FY 2013 retirement data into the retirement histogram used for future retirement.

As in prior years, the FAA projected future retirements by analyzing both the eligibility criteria of the workforce (Figure 4.3) and the pattern of retirement based on eligibility (Figure 4.4).

For each eligibility class (the fiscal year the controller first becomes eligible to retire), the agency applied the histogram percentage to estimate the retirements for each class by year.

Figure 4.5: Retirement Projection



Controller Losses Due to Resignations, Removals and Deaths

Estimated controller losses due to resignations, removals (excluding developmental attrition) and deaths are based on historical rates and shown in Table 4.2.

Table 4.2 Controller Losses Due to Resignations, Removals and Deaths

2013*	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
46	47	48	48	48	48	49	49	49	49	49
* Actual										

Developmental Attrition

Estimated losses of trainees who terminate from the FAA while still in developmental status are shown in Table 4.3. The agency has incorporated historical developmental attrition rates into the latest FAA forecasts.

Table 4.3 Developmental Attrition

2013*	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
90	133	131	113	100	96	94	88	82	76	74
* Actual										

Academy Attrition

Estimated loss figures from new hires who are not successful in the FAA Academy training program, before they ever reach an air traffic control facility, are based on historical rates and shown in Table 4.4.

Table 4.4 Academy Attrition

2013*	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
116	130	204	241	200	166	154	141	131	127	126
* Actual										

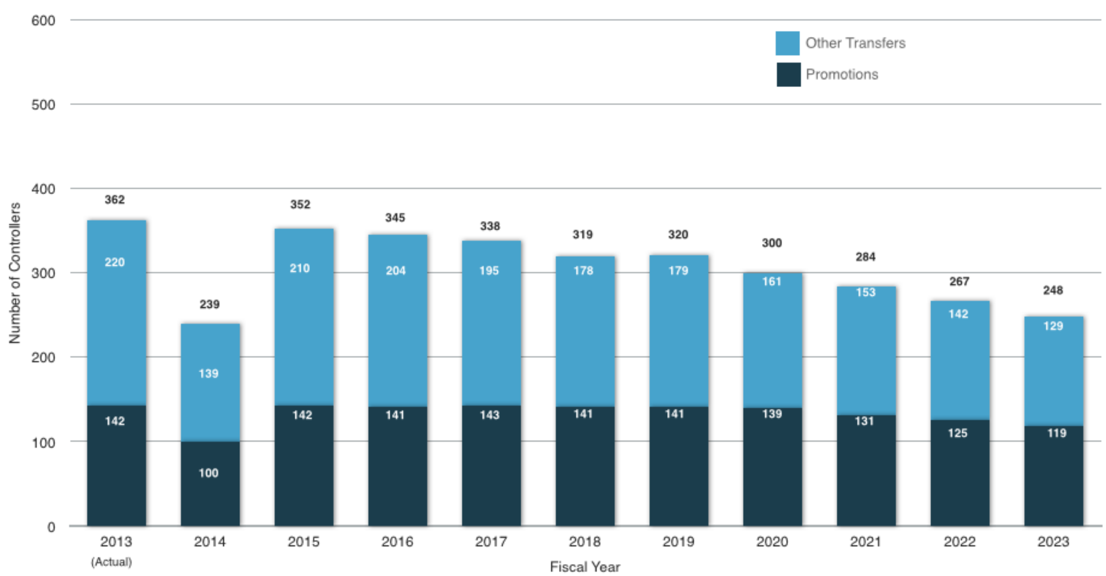
Controller Losses Due to Promotions and Other Transfers

This section presents FAA estimates of controller losses due to internal transfers to other positions (staff support specialists, traffic management coordinators, etc.) and controller losses due to promotions to front line manager or air traffic management/supervisory positions.

In addition to backfilling for supervisory attrition (retirements, promotions, etc.), the FAA expects that the supervisor workforce will likely grow along with the controller workforce, and that these additional supervisors will also come from the controller population.

This forecast is also driven by the shifting demographics of these groups. In short, an increasing number of supervisors and other air traffic personnel will become retirement eligible after 2013, creating additional opportunities for current controllers to be promoted.

Figure 4.6: Controller Losses Due to Promotions and other Transfers

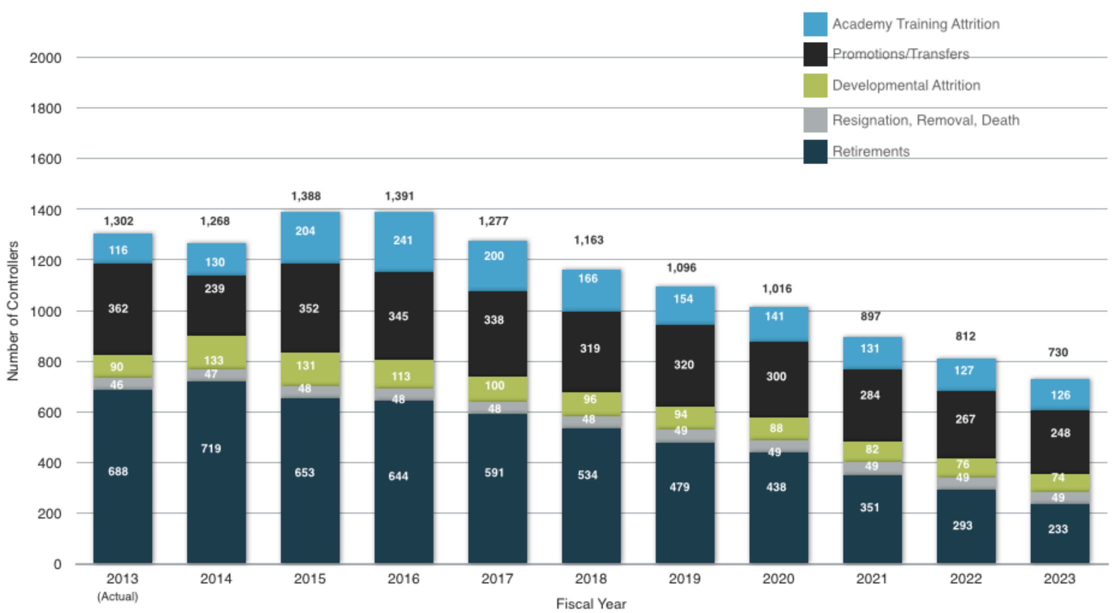


Total Controller Losses

The FAA projects a total loss of 11,038 controllers over the next 10 years.

Should losses outpace projections for FY 2014, the FAA will hire additional controllers to reach the end-of-year goal of 14,481 air traffic controllers on board.

Figure 4.7: Projected Total Controller Losses



5 - Hiring Plan

The FAA safely operates and maintains the NAS because of the combined expertise of its people, the support of technology and the application of standardized procedures. Every day tens of thousands of aircraft are guided safely and expeditiously through the NAS to their destinations.

Deploying a well-trained and well-staffed air traffic control workforce plays an essential role in fulfilling this responsibility. The FAA's current hiring plan has been designed to phase in new hires as needed. To staff the right number of people in the right places at the right time, the FAA develops annual hiring plans that are responsive to changes in traffic and in the controller workforce.

The FAA hires new developmental controllers in advance of the agency's staffing needs in order to have ample time to train them to offset future attrition, including retirements, promotions, etc. Proper execution of the hiring plan, while flexibly adapting to the dynamic nature of traffic and attrition, is critical to the plan's success. If the new developmentals are not placed correctly or if CPCs are not transferred from other facilities, shortages could occur at individual facilities that may affect schedules, increase overtime usage or require the use of more developmentals on position.

Staffing is and will continue to be monitored at all facilities throughout the year. The agency will continue to modify the hiring plan at the facility level should adjustments become necessary due to changes in traffic volume, retirements or other attrition.

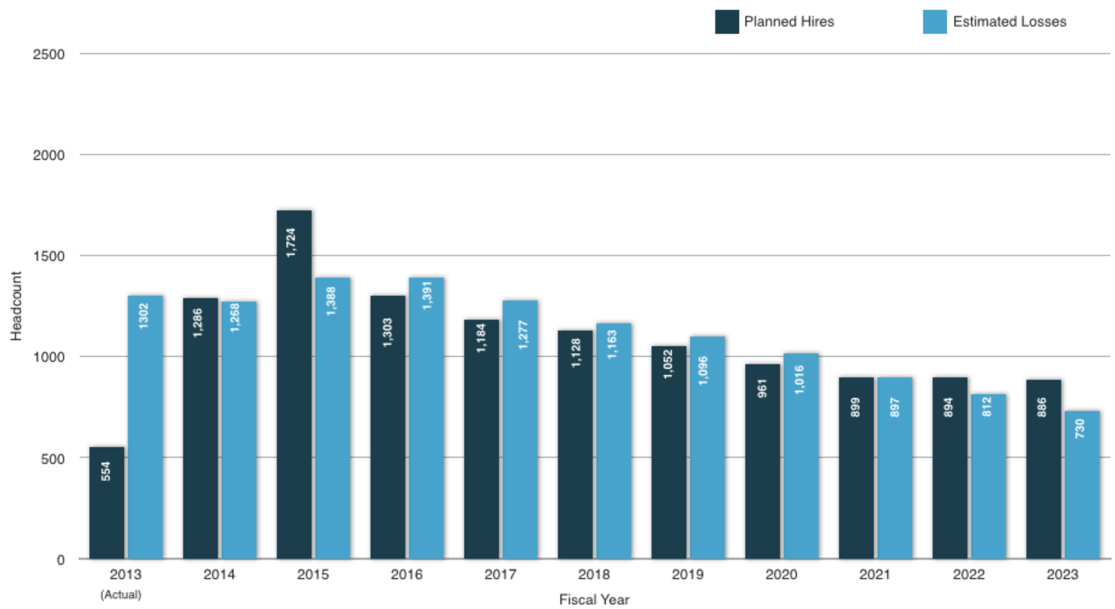
There are thousands of qualified controller candidates eager to be hired. The FAA has again been able to attract large numbers of qualified controller candidates. Through the various hiring sources, the FAA will maintain a sufficient number of applicants to achieve this hiring plan.

Controller Hiring Profile

The controller hiring profile is shown in Figure 5.1. Because of the effects of sequestration, the FAA was unable to hire the planned number of controllers in FY 2013. The number of planned hires is almost equal to the projected losses in FY 2014. The number of controllers projected to be hired through FY 2023 is 11,317.

Due to the effects of sequestration, the FAA only hired 554 new controllers in FY 2013.

Figure 5.1: Controller Hiring Profile



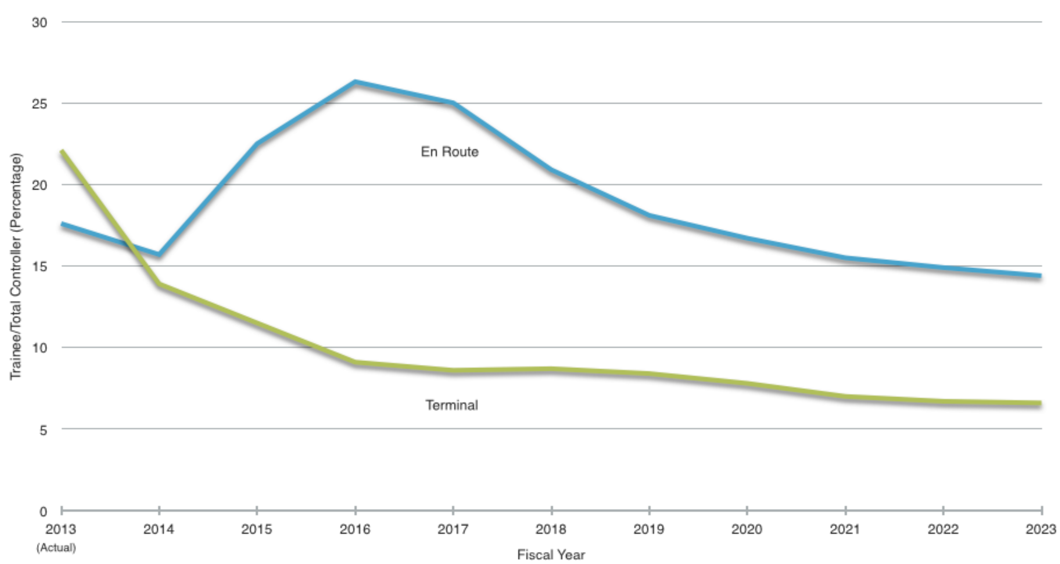
Trainee-to-Total-Controller Percentage

The hiring plan allows the FAA to maintain an appropriate number of trainees (developmental and CPC-IT) in the workforce. While the FAA strives to keep trainees below 35 percent for both Terminal and En Route controllers, it is not the only metric used by the agency to measure trainee progress.

Figure 5.2 shows the projected trainee-to-total-controller percentages for En Route and Terminal by year to 2023. The percentage shown is calculated as the sum of CPC-ITs plus developmentals divided by all controllers.

While Terminal facilities are showing a decline through 2023, there is a peak En Route for the next couple of years as controllers in the current developmental pipeline become fully certified. Note the trainee percentage for both En Route and Terminal is still well below 35 percent. The En Route trainee ratio exceeds the Terminal ratio primarily because of the longer times to certify (on average) in En Route facilities. Additionally, a portion of future year hiring requirements have shifted from Terminal to En Route as developmental failures in En Route are given the opportunity to transfer and certify at lower-level Terminal facilities.

Figure 5.2: Trainee to Total Controller Percentage



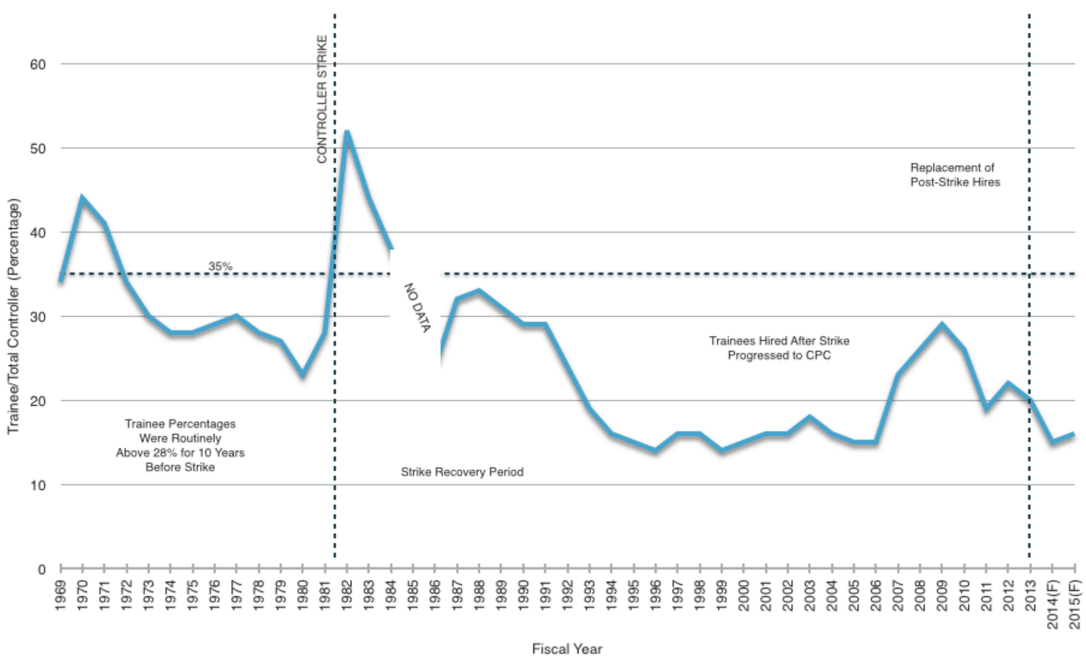
Before the 1981 strike, the FAA experienced trainee percentages ranging from 23 to 44 percent. Following the strike, through the end of the hiring wave in 1992, the trainee percentage ranged from 24 to 52 percent. When the post-strike hires became fully certified by the end of decade, the trainee percentage declined.

As the new controllers hired en masse in the early 1980s achieved full certification, the subsequent need for new hires dropped significantly from 1993 to 2006. This caused trainee percentages to reach unusually low levels. The FAA’s current hiring plans return trainee percentages to their historical averages for the near term.

By phasing in new hires as needed, the FAA will level out the significant training spikes and troughs experienced over the last 40 years. Even though there was a long-expected peak in 2009, the percentage remains low as thousands of trainees have become certified controllers.

Figure 5.3 shows historical trainee percentages from 1969 to the present.

Figure 5.3: Historical Trainee Percentage



The FAA uses many metrics (e.g., 35 percent trainee to total controllers) to manage the flow of trainees while accomplishing daily operations. Facilities meter training to coincide with a number of dynamic factors, including technology upgrades, new runway construction and recurrent proficiency training for existing CPCs. Facility training is enabled by many factors. Examples include the use of contract instructors, access to simulators, scheduled overtime, and the seasonality and complexity of operations.

In itself, the actual number of trainees does not indicate the progress of each individual in the training program or the additional utility they provide that can help to supplement other on-the-job training instruction and support operations. A key facility measure of training performance is whether trainees are completing their training within the agency's facility benchmarks. The goal ranges from one and one-half years at our lower-level Terminal facilities to three years at our En Route facilities.

The FAA is achieving these goals by improving training and scheduling processes through increased use of simulators and better tracking of controller training using the FAA's national training database.

The FAA will continue to closely monitor facilities to make sure trainees are progressing through each stage of training while also maintaining the safe and efficient operation of the NAS.

6 - Hiring Process

Controller Hiring Sources

The FAA has three major categories of controller hiring sources.

Previous controllers: These individuals have prior FAA or Department of Defense (civilian or military) air traffic control experience.

Air Traffic Collegiate Training Initiative (AT-CTI) students: These individuals have successfully completed an aviation-related program of study from a school under the FAA's AT-CTI program.

General public: These individuals are not required to have prior air traffic control experience and may apply for vacancies announced by the FAA.

Recruitment

The agency continues to attract and recruit high-quality applicants into the controller workforce to meet staffing requirements. Of the 554 controllers hired in FY 2013, 361 were graduates of AT-CTI schools, 64 were hired from the general public, while an additional 129 had previous air traffic control experience.

In FY 2013, the FAA issued individual vacancy announcements for retired military controllers and veterans eligible under the Veterans' Recruitment Appointment Authority. However, due to the hiring freeze implemented on March 1, 2013, we were unable to hire any applicants from these announcements.

Although the agency did not offer a vacancy announcement to the general public in FY 2013; we revised our hiring processes and opened an "all sources" vacancy announcement this fiscal year.

The number of people in the hiring pool varies during the year as the agency recruits applicants, evaluates them and draws from the pool. However, the overall goal is to maintain at least 2,000 to 3,000 applicants available for selection at any one time. At the conclusion of FY 2013, the FAA's pool totaled over 2,500 applicants.

As an added recruitment incentive, the agency also can offer eligible developmental controllers Montgomery GI Bill education benefits. This flexibility enables us to increase the size of the pool, which helps us meet our controller hiring goals.

General Hiring Process

Beginning in FY 2014, all applicants will be required to take a bio-data assessment that covers education, experience and work habits. Applicants who pass the bio-data assessment and meet the general requirements will then be referred to take the Air Traffic Selection and Training (AT-SAT) examination, and must achieve a qualifying score. The AT-SAT tests for characteristics needed to perform effectively as an air traffic controller. The characteristics include numeric ability, prioritization, planning, tolerance for high intensity, decisiveness, visualization, problem-solving and movement detection. The agency does not anticipate that these controller characteristics/competencies will change as NextGen technologies are introduced.

Additionally, applicants must also meet the following requirements:

- Complete three years of progressively responsible work experience, or a full four-year course of study leading to a bachelor's degree, or an equivalent combination of work experience and college credits.
- Be a U.S. citizen.
- Be able to speak English clearly enough to be understood over radios, intercoms and similar communications equipment.
- Be no older than age 30.
- Pass stringent medical and psychological exams, an extensive security background investigation and an interview.

Complete details can be found on the FAA's website at http://www.faa.gov/jobs.

7 - Training

One of the primary goals of the FAA's technical training and development programs is to ensure that our air traffic controllers have all the necessary skills and abilities to perform their jobs effectively and maintain the safety of the NAS.

The FAA's technical training framework is designed to provide controllers with training to meet the challenges of today and prepare them for the next advancements of air traffic management.

In early 2012, the FAA completed an organizational restructuring designed to improve the integration of safety into all aspects of air traffic services. The new Office of Safety and Technical Training in the Air Traffic Organization is helping the agency firmly instill the FAA's safety mission in controllers from the start of their careers. The powerful combination of safety, training and quality assurance under the same leadership structure enhances the FAA's ability to identify, mitigate and manage risks, and integrate lessons learned into the technical training curriculum. The training program for air traffic controllers is governed by FAA Order 3120.4, Air Traffic Technical Training, and is reviewed annually to ensure its technical accuracy.

FAA's Call to Action

The FAA previously reported on its independent review of the selection, assignment and training of air traffic control specialists (see http://1.usa.gov/IRP_Release), convened in 2011 as part of a nationwide Call to Action on air traffic control safety and professionalism. About a third of the Independent Review Panel's (IRP) 49 recommendations dealt with the selection and placement of air traffic control specialists, while the rest covered improvements to professionalism, on-the-job training instruction, learning technologies and record-keeping, and curriculum design, among others. While budget cuts impacted implementation of some of the planned improvements, multiple workgroups continue to work on projects that adopt the panel's recommendations. Since the previous controller workforce plan, the FAA also conducted a barrier analysis of centralized hiring for entry-level controllers (see http://1.usa.gov/18Xjyuh) and revised controller selection in February 2014 to mitigate identified issues in pre-hire processes.

To follow the work of the pre-hire improvements, the agency also designed a new placement strategy for controllers who on-board beginning as soon as the fourth quarter of FY 2014. The updated placement system allows the government to offer a field facility assignment to new hires only after successful demonstration of capability at the FAA Academy. Once a new hire -- typically on a temporary appointment -- completes all or a significant portion of revised initial training courses, the employee will be evaluated for an assignment based on (1) academic performance, (2) needs of the FAA and (3) candidate preference, and will be offered a permanent appointment to a field facility for follow-on certification training. The agency is updating training courses to support progressive grading where students are assessed at multiple points in training, with new training advancement decision points, so that students underperforming in training are either provided remedial training or are released from the agency. The revamped process will increase staffing flexibility for the agency and improve efficiency in both hiring and initial training of air traffic controllers.

The Training Process

Training begins at the FAA Academy, where students gain foundational air traffic control knowledge. Later at the facilities, they receive the classroom and on-the-job training to become certified professional controllers (CPC). All controllers are assigned periodic proficiency training, in the form of recurrent training or refresher training.

The FAA is adopting an outcome-based approach to the design and development of training, based on one of the recommendations from the IRP. The outcome-based approach refers to the strategy used to design individual courses and is based on the performance requirements found in the competency model. It uses the collection of job tasks, knowledge, skills and abilities to define the operational outcome required for the controller's job so that training can be designed accordingly. The newer approach includes mapping curriculum to job tasks, knowledge, skills and training methods. The techniques apply to new course development, redesigns and updates.

> The FAA continues to invest in making its training more effective by gearing it toward the skills needed for successful career-long development.

FAA Academy Training

The FAA Academy trains new controllers using lecture, computer-based instruction, and simulation with a range of fidelity. The academy lays the foundation for controller development by teaching common, fundamental air traffic control procedures that are used throughout the country.

In 2011, the FAA began looking at ways to modernize courses at the FAA Academy, expanding the required level of knowledge and increasing students' proficiency. Enhanced training content ensures the FAA can bridge the gap between FAA Academy training and the field requirements at the higher-level facilities. This effort achieves the goals of improving quality and increasing the effectiveness of training as controllers reach CPC.

FAA Facility Training

After graduating from the FAA Academy, developmental controllers begin facility training in the classroom, where they learn facility-specific rules and procedures. Often, these rules and procedures are practiced in simulation. The FAA is increasing the use of simulators -- technology that allows instructors to duplicate and play back actual operating events to give students opportunities for improvement in a safe environment. Simulators enable students to not only see the cause and effect, but also to avoid mistakes in the future. Until recently, controllers working in airport traffic control towers trained solely on live air traffic. Since live traffic is inconsistent and unpredictable due to weather and system delays, a controller may have to wait days or weeks for an opportunity to learn a particular procedure, and even longer to become proficient at it. The FAA uses simulation to help compress the training timeline while also improving the students' learning experience and reducing training costs.

After classroom and simulation training are complete, developmental controllers begin on-the-job training on operational positions. This training is conducted by CPCs who observe and instruct developmental controllers working the control position. Once they are certified on control positions, developmental controllers often work independently on those positions under the direction of a supervisor to gain experience and to supplement staffing.

The Flight Deck Training (FDT) program is supplemental training designed for current controllers to improve understanding and communications between controllers and pilots. It complements the overall controller training curriculum by providing a perspective from the flight deck and focusing on specific training outcomes. During 2013, the FDT program accomplished over 2,000 training flights, added three new provider airlines (for a total of 28) and completed development and deployment of eLearning Management System (eLMS)-based flight completion tracking. The FDT team also completed the first phase of automating the request and approval process to be deployed in 2014.

Recurrent Training

In 2012, the FAA initiated a new method to enhance controller proficiency: recurrent training. The recurrent training program is administered annually as a combination of cadre-led and computer-based instruction for air traffic controllers that delivers evidence-based topics derived from the Air Traffic Safety Action Program (ATSAP), Quality Assurance and Quality Control activities and data. As contrasted with annually-required refresher training on static, predetermined topics, recurrent training delivers timely and directly relevant safety training based on safety trends and lessons learned from safety data and analysis. Recurrent training is developed in collaboration with subject matter experts from the National Air Traffic Controllers Association.

Most recently, the FAA initiated a multi-year, three-step program to revise and update its training courses for on-the-job training field instructors. It is especially important for field instructors to maintain proficiency on all of the latest skills, new procedures and technologies coming into the system through NextGen improvements.

Infrastructure Investments

To improve the performance and reliability of eLMS across the ATO, the FAA set up a Content Delivery Network (CDN) on Computer Based Instruction (CBI) training platforms. This system delivers replacement CBI hard drives with all qualified eLMS course content to air traffic facilities. The CDN is basically a network that places the eLMS content on a distributor at the site so the content is viewed from the LAN instead of downloading the content every time it's viewed. Approximately 150 air traffic sites have the CDN solution installed, and there are plans to deploy the CDN solution to the remaining Air Traffic sites in 2014-2015. Sites with the CDN configuration have the ability to view more robust training typically associated with multimedia and simulation.

Time to Certification

The FAA continues to meet its overall goals for time to certification and number of controllers certified. Implementation of NextGen platforms such as En Route Automation Modernization (ERAM) and new training requirements are factors that affect overall time to CPC. Depending on the type of facility, facility level (complexity) and the number of candidates to certify, controllers are generally completing certification in one and one-half to three years.

Table 7.1 shows the FAA's training targets by facility type and actual training times through the end of FY 2013 for certified air traffic controllers from the fiscal year hiring classes of 2007, 2008, and 2009. More than 90 percent of controllers in these hiring classes have completed training.

Previous versions of the controller workforce plan reported time to certification based on the year in which the controllers became certified rather than the hiring-class method. The change was made to better compare the impact of changes in training activities to minimize the impact of outlier data, and to ensure greater consistency with the FAA's internal reporting metrics.

Given the 1.5-to 3-year targeted training times for new Terminal and En Route controllers, Table 7.1 reflects actual training behavior for controllers who started in FY 2007 to FY 2009. In addition, the FAA continues to monitor the pace of new hires from more recent hiring classes (i.e., 2010-2013), which shows that training times are generally similar to or slightly slower than those shown in Table 7.1. The FAA will report actual training times for these classes after completion rates reach

	FAA Goal	FY 2007	FY 2008	FY2009
En Route	3.0	2.56	2.73	2.92
Terminal 4-6	1.5	1.86	2.00	2.25
Terminal 7-9	2.0	1.92	2.24	2.44
Terminal 10-12	2.5	2.03	2.28	2.45

90 percent.

Table 7.1 Years to Certify

Note: More recent hiring classes (FY 2010 forward) are not reported as there are still greater than 10 percent of the class in progress, resulting in continuously changing metrics as those students certify or fail.

Developmental controllers who fail to certify at a facility may be removed from service or reassigned to a less complex facility in accordance with agency policies and directives. The ultimate goal of the training program is for the controller to achieve certification on all positions at a facility and attain CPC status while maintaining the safety of the NAS.

Preparing for NextGen

The Office of Safety and Technical Training provides critical input to support implementation of NextGen. Training professionals are part of an FAA team that evaluates how NextGen will change the air traffic work environment and what competencies will be required for the future workforce. The FAA is incorporating what it learns from this evolving and ongoing process into training programs as new systems are implemented. Outcomes-based training aligns NextGen functionality with job tasks as well, so that the training organization can make predictions on how programs will need to change with the advent of NextGen.

In 2013, the Technical Training office worked with data from NextGen Human Factors to estimate how much training would be affected by NextGen technologies being introduced to the workforce in the mid-term range. Using the Human Factors' Strategic Training Needs Assessment (STNA), the FAA assessed what training development needs were likely to be.

Some of the Technical Training office's NextGen training efforts involve Time Based Flow Management (TBFM), ERAM and ADS-B.

- The TBFM system enhances system efficiency and improves traffic flow by leveraging the capabilities of the Traffic Management Advisor (TMA) decision support tool. TBFM has been in the field for many years, but a national training program was never developed. The Technical Training office is now filling the training gap with a series of courses for the Web and classroom to be implemented as supplemental or refresher training.

- Multiple courses covering ERAM have been implemented to support the transition of En Route facilities to this new technology. Courses include workforce training, refresher training, supplemental training, and cadre training for instructors who deliver training in the field. These various courses enable a consistent yet flexible delivery of ERAM training as facilities cycle through the phases of system implementation.

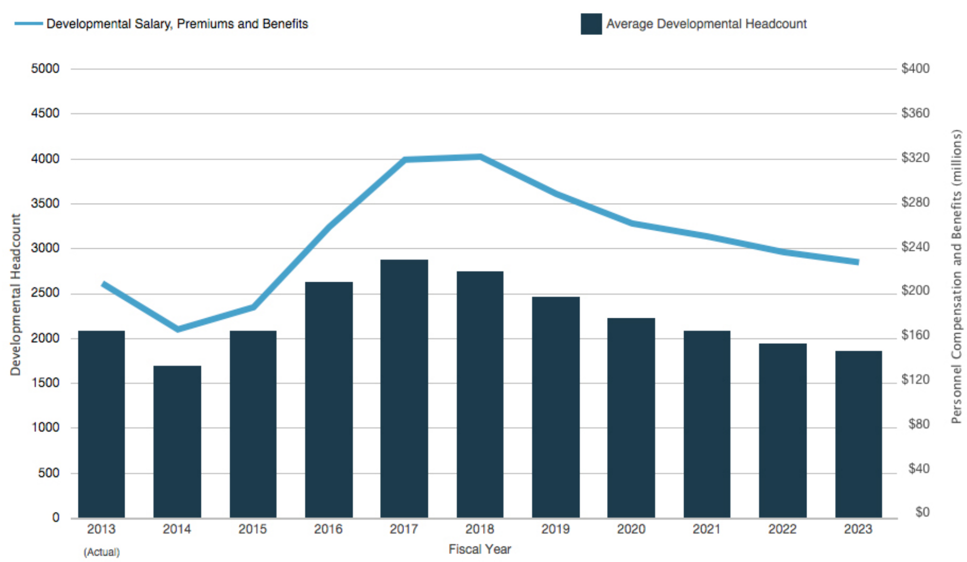
- ADS-B training combines instructor-led training with hands-on performance verification on the actual equipment. This training covers ADS-B, FUSED Mode and associated new functionality in the Standard Terminal Automation Replacement System (STARS).

8 - Funding Status

In addition to direct training costs, the FAA will incur salary and other costs for developmental controllers before they certify. The average cost of a developmental in FY 2014 is projected to be $98,754.

Figure 8.1 depicts expected annual compensation costs of developmentals, as well as the expected number of developmentals by year through 2023. As training takes one and one-half to three years, the chart depicts a rolling total of hires and costs from the current and previous years. It also incorporates the effect of the controller contract.

Figure 8.1: Estimated Cost of Developmentals Before Certification



Appendix: 2014 Facility Staffing Ranges

The Appendix below, presents controller staffing ranges, by facility, for En Route and Terminal air traffic control facilities for FY 2014. Additional detail on how the staffing ranges are calculated is provided in Chapter 3.

In general, the FAA strives to keep the number of CPCs and CPC-ITs near the middle of the range. While most of the work is accomplished by CPC's, work is also being performed in facilities by CPC-IT and position-qualified developmental controllers who are proficient, or checked out, in specific sectors or positions and handle work independently. Accordingly, facilities can safely operate even with CPC staffing levels below the defined staffing range.

Conversely, a facility's total staffing levels are often above the defined staffing range because new controllers are typically hired two to three years in advance of expected attrition to allow for sufficient training time. The total expected end-of-year staffing number shown in Figure 3.1 reflects this projected advanced hiring.

En Route Facility Controller Staffing Ranges

		CPC	CPC-IT	Developmentals	Total	Staffing Range	
ID	Facility Name					Low	High
ZAB	Albuquerque ARTCC	189	2	25	216	168	205
ZAN	Anchorage ARTCC	74	6	17	97	79	97
ZAU	Chicago ARTCC	314	23	45	382	276	338
ZBW	Boston ARTCC	227	11	29	267	189	231
ZDC	Washington ARTCC	267	16	80	363	256	313
ZDV	Denver ARTCC	254	17	41	312	229	280
ZFW	Fort Worth ARTCC	259	25	34	318	223	273
ZHU	Houston ARTCC	236	14	33	283	190	233
ZID	Indianapolis ARTCC	294	5	27	326	252	309
ZJX	Jacksonville ARTCC	266	11	38	315	224	273
ZKC	Kansas City ARTCC	219	7	34	260	197	241
ZLA	Los Angeles ARTCC	213	14	63	290	226	276
ZLC	Salt Lake City ARTCC	175	4	17	196	142	173
ZMA	Miami ARTCC	245	7	33	285	203	248
ZME	Memphis ARTCC	239	8	40	287	216	265
ZMP	Minneapolis ARTCC	238	7	31	276	209	256
ZNY	New York ARTCC	241	11	76	328	245	299
ZOA	Oakland ARTCC	156	10	49	215	181	221
ZOB	Cleveland ARTCC	321	18	38	377	270	331
ZSE	Seattle ARTCC	138	4	28	170	132	161
ZSU	San Juan ARTCC	36	7	11	54	46	56
ZTL	Atlanta ARTCC	367	9	36	412	266	325
ZUA	Guam ARTCC	15	0	4	19	17	20
En Route Total		**4,983**	**236**	**829**	**6,048**	**4,436**	**5,424**

Terminal Facility Controller Staffing Ranges

ID	Facility Name	CPC	CPC-IT	Developmentals	Total	Staffing Range Low	Staffing Range High
A11	Anchorage TRACON	19	3	0	22	21	25
A80	Atlanta TRACON	79	14	0	93	79	97
A90	Boston TRACON	58	4	0	62	46	56
ABE	Allentown Tower	20	4	5	29	23	28
ABI	Abilene Tower	14	0	6	20	16	19
ABQ	Albuquerque Tower	28	2	4	34	23	29
ACK	Nantucket Tower	11	0	0	11	10	12
ACT	Waco Tower	11	2	7	20	16	19
ACY	Atlantic City Tower	20	3	3	26	23	28
ADS	Addison Tower	12	1	0	13	9	10
ADW	Andrews Tower	13	2	0	15	11	14
AFW	Alliance Tower	14	2	1	17	11	13
AGC	Allegheny Tower	13	1	4	18	11	14
AGS	Augusta Tower	13	0	6	19	13	16
ALB	Albany Tower	19	2	5	26	22	26
ALO	Waterloo Tower	8	0	3	11	12	14
AMA	Amarillo Tower	14	0	5	19	14	17
ANC	Anchorage Tower	23	1	0	24	21	26
APA	Centennial Tower	19	3	1	23	17	20
APC	Napa Tower	8	0	0	8	7	9
ARB	Ann Arbor Tower	7	0	1	8	6	7
ARR	Aurora Tower	11	0	0	11	8	10
ASE	Aspen Tower	8	2	6	16	11	13
ATL	Atlanta Tower	41	14	0	55	43	53
AUS	Austin Tower	27	12	1	40	31	38
AVL	Asheville Tower	13	0	3	16	14	17
AVP	Wilkes-Barre Tower	19	0	3	22	18	22
AZO	Kalamazoo Tower	16	2	5	23	13	16
BDL	Bradley Tower	15	0	5	20	11	14
BED	Hanscom Tower	14	0	3	17	11	13
BFI	Boeing Tower	21	1	4	26	16	19
BFL	Bakersfield Tower	12	5	7	24	18	23
BGM	Binghamton Tower	17	0	2	19	13	15
BGR	Bangor Tower	15	2	6	23	16	20
BHM	Birmingham Tower	23	3	2	28	22	27
BIL	Billings Tower	16	1	6	23	16	20
BIS	Bismarck Tower	15	0	0	15	13	16
BJC	Broomfield Tower	12	0	0	12	9	11
BNA	Nashville Tower	28	9	3	40	32	39
BOI	BOISE Tower	25	3	5	33	22	27
BOS	Boston Tower	30	6	0	36	25	30
BPT	Beaumont Tower	11	0	0	11	8	9
BTR	Baton Rouge Tower	13	3	4	20	15	18

ID	Facility Name	CPC	CPC-IT	Developmentals	Total	Staffing Range	
						Low	High
BTV	Burlington Tower	13	3	5	21	15	18
BUF	Buffalo Tower	25	1	10	36	24	29
BUR	Burbank Tower	15	2	4	21	14	17
BWI	Baltimore Tower	27	1	0	28	20	24
C90	Chicago TRACON	73	18	0	91	78	95
CAE	Columbia Tower	22	0	6	28	18	22
CAK	Akron-Canton Tower	27	2	1	30	20	24
CCR	Concord Tower	12	0	0	12	8	10
CDW	Caldwell Tower	9	0	1	10	8	10
CHA	Chattanooga Tower	13	0	9	22	15	19
CHS	Charleston Tower	21	3	4	28	20	24
CID	Cedar Rapids Tower	14	0	4	18	14	17
CKB	Clarksburg Tower	15	1	3	19	15	18
CLE	Cleveland Tower	38	9	6	53	37	45
CLT	Charlotte Tower	66	24	1	91	75	92
CMA	Camarillo Tower	10	2	4	16	8	10
CMH	Columbus Tower	44	6	2	52	36	45
CMI	Champaign Tower	15	0	2	17	14	17
CNO	Chino Tower	10	2	2	14	9	12
COS	Colorado Springs Tower	22	7	4	33	23	28
CPR	Casper Tower	9	0	7	16	11	13
CPS	Downtown Tower	10	1	2	13	9	10
CRP	Corpus Christi Tower	26	5	7	38	31	38
CRQ	Palomar Tower	14	0	0	14	9	12
CRW	Charleston Tower	18	0	6	24	19	24
CSG	Columbus Tower	6	0	3	9	6	8
CVG	Cincinnati Tower	60	1	1	62	36	44
D01	Denver TRACON	58	19	0	77	70	85
D10	Dallas - Ft Worth TRACON	56	20	2	78	73	89
D21	Detroit TRACON	43	9	1	53	47	57
DAB	Daytona Beach Tower	38	11	4	53	45	56
DAL	Dallas Love Tower	23	4	0	27	17	21
DAY	Dayton Tower	16	1	0	17	10	13
DCA	Washington National Tower	22	8	3	33	23	28
DEN	Denver Tower	38	4	0	42	36	44
DFW	DFW Tower	50	5	0	55	46	56
DLH	Duluth Tower	15	0	7	22	16	19
DPA	Dupage Tower	13	1	1	15	12	15
DSM	Des Moines Tower	17	3	3	23	19	23
DTW	Detroit Tower	35	5	0	40	27	34
DVT	Deer Valley Tower	19	0	4	23	17	21
DWH	Hooks Tower	13	2	1	16	11	13
E10	High Desert TRACON	22	2	10	34	25	31
ELM	Elmira Tower	9	1	6	16	12	15
ELP	El Paso Tower	18	0	4	22	18	23

		CPC	CPC-IT	Developmentals	Total	Staffing Range	
ID	Facility Name					Low	High
EMT	El Monte Tower	12	0	1	13	6	8
ERI	Erie Tower	16	3	6	25	12	15
EUG	Eugene Tower	16	6	1	23	16	20
EVV	Evansville Tower	18	0	3	21	14	17
EWR	Newark Tower	23	9	1	33	27	34
F11	Central Florida TRACON	37	15	0	52	46	56
FAI	Fairbanks Tower	18	2	3	23	19	24
FAR	Fargo Tower	14	2	4	20	16	19
FAT	Fresno Tower	19	6	3	28	22	26
FAY	Fayetteville Tower	21	0	5	26	22	26
FCM	Flying Cloud Tower	12	0	0	12	7	9
FFZ	Falcon Tower	13	1	0	14	13	15
FLL	Fort Lauderdale Tower	26	2	0	28	20	24
FLO	Florence Tower	9	1	7	17	10	12
FNT	Flint Tower	16	1	4	21	12	15
FPR	St Lucie Tower	13	0	0	13	9	12
FRG	Farmingdale Tower	14	0	2	16	13	16
FSD	Sioux Falls Tower	12	1	4	17	15	18
FSM	Fort Smith Tower	24	0	1	25	19	23
FTW	Meacham Tower	12	1	2	15	11	13
FWA	Fort Wayne Tower	18	1	6	25	18	22
FXE	Fort Lauderdale Executive Tower	13	0	5	18	14	17
GCN	Grand Canyon Tower	6	2	3	11	9	10
GEG	Spokane Tower	23	2	6	31	19	23
GFK	Grand Forks Tower	20	1	2	23	21	25
GGG	Longview Tower	13	0	4	17	15	18
GPT	Gulfport Tower	12	3	7	22	14	18
GRB	Green Bay Tower	25	0	0	25	17	20
GRR	Grand Rapids Tower	17	1	6	24	17	21
GSO	Greensboro Tower	23	3	7	33	23	28
GSP	Greer Tower	16	0	7	23	16	20
GTF	Great Falls Tower	11	1	9	21	16	19
HCF	Honolulu Control Facility	70	10	22	102	84	103
HEF	Manassas Tower	13	0	0	13	8	10
HIO	Hillsboro Tower	13	1	2	16	12	15
HLN	Helena Tower	6	0	5	11	8	10
HOU	Hobby Tower	29	1	0	30	16	19
HPN	Westchester Tower	11	0	8	19	14	17
HSV	Huntsville Tower	17	1	7	25	15	18
HTS	Huntington Tower	18	0	7	25	17	20
HUF	Terre Haute /Hulman ATCT/TRACON	9	1	9	19	12	15
HWD	Hayward Tower	9	1	4	14	9	10
I90	Houston TRACON	79	11	2	92	77	94
IAD	Dulles Tower	30	5	2	37	25	31
IAH	Houston Intercontinental Tower	40	6	0	46	30	37

ID	Facility Name	CPC	CPC-IT	Developmentals	Total	Staffing Range Low	Staffing Range High
ICT	Wichita Tower	30	6	1	37	27	33
ILG	Wilmington Tower	12	1	2	15	9	10
ILM	Wilmington Tower	17	1	5	23	15	18
IND	Indianapolis Tower	48	4	3	55	35	43
ISP	Islip Tower	14	0	6	20	12	15
ITO	Hilo Tower	14	1	1	16	16	19
JAN	Jackson Tower	11	3	5	19	14	17
JAX	Jacksonville Tower	28	10	12	50	37	45
JFK	Kennedy Tower	25	4	5	34	28	34
JNU	Juneau Tower	10	0	1	11	10	12
K90	Cape TRACON	21	4	1	26	19	23
L30	Las Vegas TRACON	37	22	1	60	42	51
LAF	Lafayette Tower	7	1	1	9	8	10
LAN	Lansing Tower	18	2	5	25	17	21
LAS	Las Vegas Tower	31	10	0	41	33	40
LAX	Los Angeles Tower	37	16	0	53	37	45
LBB	Lubbock Tower	12	2	5	19	16	19
LCH	Lake Charles Tower	13	1	1	15	14	17
LEX	Lexington Tower	20	0	7	27	18	22
LFT	Lafayette Tower	14	1	5	20	14	18
LGA	La Guardia Tower	29	5	1	35	27	33
LGB	Long Beach Tower	22	3	0	25	15	19
LIT	Little Rock Tower	24	0	6	30	23	28
LNK	Lincoln Tower	11	1	0	12	8	10
LOU	Bowman Tower	10	1	2	13	7	9
LVK	Livermore Tower	10	0	0	10	8	10
M03	Memphis TRACON	28	4	6	38	28	34
M98	Minneapolis TRACON	48	10	0	58	44	54
MAF	Midland Tower	16	1	9	26	19	23
MBS	Saginaw Tower	11	2	5	18	12	15
MCI	Kansas City Tower	36	1	1	38	30	37
MCO	Orlando Tower	25	2	0	27	21	26
MDT	Harrisburg Intl Tower	21	3	6	30	22	26
MDW	Midway Tower	26	2	0	28	18	22
MEM	Memphis Tower	29	0	1	30	22	27
MFD	Mansfield Tower	12	1	6	19	13	16
MGM	Montgomery Tower	10	4	3	17	16	19
MHT	Manchester Tower	15	0	0	15	10	12
MIA	Miami Tower	72	17	9	98	80	97
MIC	Crystal Tower	12	1	0	13	7	8
MKC	Downtown Tower	15	0	1	16	11	13
MKE	Milwaukee Tower	38	10	7	55	35	43
MKG	Muskegon Tower	16	0	4	20	14	17
MLI	Quad City Tower	7	1	8	16	12	15
MLU	Monroe Tower	9	0	4	13	11	13

ID	Facility Name	CPC	CPC-IT	Developmentals	Total	Staffing Range Low	Staffing Range High
MMU	Morristown Tower	13	2	2	17	9	12
MOB	Mobile Tower	20	3	5	28	18	23
MRI	Merrill Tower	13	0	1	14	8	10
MRY	Monterey Tower	9	0	2	11	7	9
MSN	Madison Tower	17	4	3	24	17	21
MSP	Minneapolis Tower	32	4	0	36	28	35
MSY	New Orleans Tower	29	5	1	35	30	36
MWH	Grant County Tower	12	0	2	14	14	17
MYF	Montgomery Tower	12	0	2	14	10	13
MYR	Myrtle Beach Tower	13	2	8	23	17	21
N90	New York TRACON	149	17	16	182	173	212
NCT	Northern California TRACON	157	27	3	187	144	176
NEW	Lakefront Tower	9	0	0	9	6	8
NMM	Meridian TRACON	8	1	5	14	11	13
OAK	Oakland Tower	21	8	1	30	19	23
OGG	Maui Tower	8	3	4	15	10	12
OKC	Oklahoma City Tower	24	4	8	36	27	34
OMA	Eppley Tower	16	0	3	19	10	13
ONT	Ontario Tower	16	3	1	20	12	15
ORD	Chicago O'Hare Tower	51	25	0	76	53	65
ORF	Norfolk Tower	27	3	10	40	27	33
ORL	Orlando Executive, FL Tower	14	0	0	14	9	11
P31	Pensacola TRACON	32	2	4	38	26	32
P50	Phoenix TRACON	54	7	0	61	52	64
P80	Portland TRACON	21	6	1	28	23	29
PAE	Paine Tower	10	1	3	14	8	10
PAO	Palo Alto Tower	7	1	6	14	9	11
PBI	Palm Beach Tower	30	7	7	44	35	42
PCT	Potomac TRACON	137	33	17	187	136	166
PDK	DeKalb - Peachtree Tower	15	5	2	22	11	14
PDX	Portland Tower	23	2	0	25	18	22
PHF	Patrick Henry Tower	12	0	1	13	9	11
PHL	Philadelphia Tower	74	20	0	94	69	84
PHX	Phoenix Tower	27	5	0	32	26	32
PIA	Peoria Tower	12	0	6	18	14	18
PIE	St Petersburg Tower	12	1	3	16	9	12
PIT	Pittsburgh Tower	43	4	0	47	32	39
PNE	Northeast Philadelphia Tower	10	0	3	13	7	9
PNS	Pensacola Tower	15	0	0	15	9	11
POC	Brackett Tower	9	2	0	11	8	10
POU	Poughkeepsie Tower	10	0	3	13	8	10
PRC	Prescott Tower	11	1	1	13	13	16
PSC	Pasco Tower	16	0	2	18	13	16
PSP	Palm Springs Tower	9	1	3	13	8	10
PTK	Pontiac Tower	13	0	1	14	10	13

ID	Facility Name	CPC	CPC-IT	Developmentals	Total	Staffing Range Low	Staffing Range High
PUB	Pueblo Tower	13	1	1	15	12	15
PVD	Providence Tower	24	3	4	31	22	27
PWK	Chicago Executive Tower	12	1	1	14	8	10
PWM	Portland Tower	18	2	5	25	16	19
R90	Omaha TRACON	21	1	0	22	16	20
RDG	Reading Tower	13	0	2	15	13	16
RDU	Raleigh-Durham Tower	37	6	1	44	34	42
RFD	Rockford Tower	18	1	5	24	15	18
RHV	Reid-Hillview Tower	13	0	1	14	9	10
RIC	Richmond Tower	14	0	6	20	11	14
RNO	Reno Tower	13	3	0	16	11	13
ROA	Roanoke Tower	19	2	8	29	20	24
ROC	Rochester Tower	23	1	6	30	19	23
ROW	Roswell Tower	12	1	1	14	13	15
RST	Rochester Tower	16	0	2	18	12	15
RSW	Fort Myers Tower	21	7	0	28	23	28
RVS	Riverside Tower	15	1	2	18	10	12
S46	Seattle TRACON	40	17	0	57	41	50
S56	Salt Lake City TRACON	36	7	7	50	38	47
SAN	San Diego Tower	26	3	0	29	16	20
SAT	San Antonio Tower	36	6	5	47	39	48
SAV	Savannah Tower	23	1	4	28	19	23
SBA	Santa Barbara Tower	24	10	0	34	22	27
SBN	South Bend Tower	13	1	7	21	17	21
SCK	Stockton Tower	8	0	0	8	6	8
SCT	Southern California TRACON	214	24	5	243	185	227
SDF	Standiford Tower	31	9	6	46	35	43
SDL	Scottsdale Tower	11	1	2	14	9	10
SEA	Seattle Tower	28	4	0	32	21	26
SEE	Gillespie Tower	12	1	1	14	10	13
SFB	Sanford Tower	17	3	1	21	16	20
SFO	San Francisco Tower	28	8	0	36	28	35
SGF	Springfield Tower	27	0	5	32	21	26
SHV	Shreveport Tower	14	0	12	26	19	23
SJC	San Jose Tower	16	1	2	19	10	12
SJU	San Juan Tower	13	1	7	21	14	17
SLC	Salt Lake City Tower	26	4	3	33	24	30
SMF	Sacramento Tower	15	0	0	15	11	14
SMO	Santa Monica Tower	11	3	0	14	8	10
SNA	John Wayne Tower	24	8	0	32	18	22
SPI	Springfield Tower	10	1	1	12	11	13
SRQ	Sarasota Tower	13	0	1	14	9	11
STL	St Louis Tower	19	3	0	22	14	17
STP	St Paul Tower	14	0	0	14	8	10
STS	Sonoma Tower	7	1	1	9	7	9

ID	Facility Name	CPC	CPC-IT	Developmentals	Total	Staffing Range Low	Staffing Range High
STT	St Thomas Tower	11	0	1	12	8	10
SUS	Spirit Tower	10	0	1	11	9	11
SUX	Sioux Gateway Tower	7	0	9	16	12	14
SYR	Syracuse Tower	20	0	6	26	18	22
T75	St Louis TRACON	30	3	1	34	22	27
TEB	Teterboro Tower	17	6	3	26	18	23
TLH	Tallahassee Tower	19	2	2	23	15	18
TMB	Tamiami Tower	16	1	1	18	12	15
TOA	Torrance Tower	13	0	1	14	9	12
TOL	Toledo Tower	17	2	5	24	18	22
TPA	Tampa Tower	47	8	4	59	46	57
TRI	Tri-Cities Tower	15	0	5	20	15	19
TUL	Tulsa Tower	29	1	5	35	22	27
TUS	Tucson Tower	12	2	1	15	11	14
TVC	Traverse City Tower	9	0	0	9	7	9
TWF	Twin Falls Tower	8	0	3	11	8	10
TYS	Knoxville Tower	17	1	7	25	21	25
U90	Tucson TRACON	16	2	4	22	15	18
VGT	North Las Vegas Tower	10	6	0	16	9	12
VNY	Van Nuys Tower	20	5	2	27	19	24
VRB	Vero Beach Tower	12	0	4	16	10	12
Y90	Yankee TRACON	16	7	6	29	18	22
YIP	Willow Run Tower	12	0	0	12	10	12
YNG	Youngstown Tower	16	0	7	23	15	19
Terminal Total		**6,550**	**951**	**912**	**8,413**	**6,220**	**7,617**

En Route Total	**4,983**	**236**	**829**	**6,048**	**4,436**	**5,424**
Terminal Total	**6,550**	**951**	**912**	**8,413**	**6,220**	**7,617**
Grand Total	**11,533**	**1,187**	**1,741**	**14,461**	**10,656**	**13,041**

Note: Totals do not include new hires at the FAA Academy